VICK'S MONTHLY MAGAZINE.

MARCH, 1880.

"WHATEVER is worth doing is worth doing well," is the belief of almost every one, but, unfortunately, practice is not usually in accord with principle. There was a time, which many of our readers can remember, when little regard was paid to quality by the purchasers of fruit and other products of the farm and garden. Apples and Strawberries sold for a certain price by the bushel or quart, whether good or bad, the former only, perhaps, meeting with a more ready sale, so that careful, painstaking growers received little encouragement and less pay for their labor and care. All this, however, has changed for the better, and now choice fruit, and butter, and cheese, are always in demand, and at remunerating prices, while that of poor quality is always cheap, too often abundant, and frequently seeks in vain for a purchaser at any price.

Good-keeping winter Apples are scarcely to be found in England, of home growth, and, we presume, never will be, on account of the warm, damp autumns. As our readers know, a warm fall in the northern States affects the keeping qualities of fruit very injuriously, making our winter Apples ripen and decay early, almost changing them to fall fruit. In the olden time, when we knew more of England than now, and we presume it is still the same, common Apples were brought every season from the Channel Island, Jersey and Guernsey, and also from France. There is, therefore, in England, an abundance of common fruit. For several years the United States and Canada have been sending Apples to Europe in large quantities, but not one-half shipped to foreign countries have yielded the shippers remunerating prices. Indeed, several Western New York shippers have informed us that loss and not gain is the general rule. We have seen plenty of American Apples in England that would scarcely pay the cost of freight. The reasons of failure are the inferior quality of the fruit sent, and the improper manner in which it was packed. Good American Apples, will always sell at high and richly remunerating prices. To all shippers of Apples to Europe we say, be honest, let the quality be equal from the top to the bottom of the barrel; select the choicest fruit, and pack with the greatest possible care, regardless of labor or expense.

As we have shipped Apples to Europe, every autumn, for more than ten years, and with only two failures, perhaps our experience may be of some value. One of these failures was in trusting to others who claimed experience in fruit-packing, and the other in the trial of an experiment. Having obtained the choicest Apples, we wrap each one in manilla tissue-paper, as Oranges are wrapped. They are then packed as solid as possible, just putting a layer of soft chaff at the bottom of the barrel, and sifting some of the same material over every layer, thus filling up the interstices. When the barrel is full, plenty of soft packing is placed on top,

and the head pressed firmly down. In this condition Apples will travel for months without material injury. We have also found that boxes are a little better than barrels for packing Apples. The rolling of barrels, with the natural spring of the staves, is a severe test, and unless the packing is done in the most thorough manner, will injure, and perhaps ruin the fruit.

It is difficult and almost impossible to procure an extra barrel of Apples in any of our markets. An extensive dealer refused us a barrel last fall, at any price, stating that it would make ten barrels worthless, so that only one-tenth of the lot were choice fruit. That there is no necessity for growing such a large percentage of poor fruit, we fully believe, and that the cause is neglect of pruning the tree and thinning the fruit, supposing, of course, that the soil is in good condition. Many never think of pruning an Apple tree, while others enter the orchard with an ax and saw, and ruthlessly sever a few of the large limbs, instead of judiciously cutting out some of the smaller twigs with the pruning knife. In consequence of this neglect, a large crop of fruit is borne, of small size from over-bearing, and poorly colored for want of light. This over-cropping weakens the tree, and next year it requires a season of rest, and no fruit is produced, so that most of our trees bear only every other year.

At the last meeting of the Horticultural Society of Western New York, when we urged the advantage of properly pruning trees and thinning the fruit, it was claimed by one member that this was too costly an undertaking, and whoever did it once would not undertake the job again, or have it done by proxy. The latter is very likely to be the case, for those who conduct business of any extent must have the principal part done by proxy. One pair of hands can do but little, but a good head can accomplish wonders. We will suppose that a tree bears five barrels every other year, and that four of them are barely marketable, at $1.50 per barrel. A day's labor, costing $1.00, by a good man, will do all the thinning out of superfluous branches and fruit. If the result is three barrels of choice fruit, which any one will be glad to get at $2.00 per barrel, there is still one dollar's deficiency, but a good deal of pleasure gained in growing and selling a choice article. If the next, and usually the non-bearing year, two barrels of good fruit is grown, there is a gain of two dollars in this mode of culture. These figures, however, are more favorable to the poor fruit than the facts warrant, for choice fruit for exportation is always worth twice the price of common fruit.

The usual system of packing Apples is simply barbarous, and especially so if designed for exportation. With more cunning than honesty, the best fruit is usually selected for the top of the barrel. Once, when in LeRoy, and wishing to present a barrel of Apples to some of the young ladies at the Ingham University, in that village, we called on Mr. KEENEY, a dealer, who informed us that he had received a consignment of Northern Spies from a gentleman further south, one well-known to the members of fruit-growers' and horticultural associations, which he would show me. So, what was supposed to be the head was removed, and a very poor lot of small, half-colored fruit revealed. "The foolish fellow," Mr. K. exclaimed, "always puts the best fruit on the top of the barrel, and then half the time marks the wrong end." After thus selecting the best specimens for the top of the barrel, the custom is to press the head down with machinery, crushing and ruining them. In fact, using the fruit for packing instead of selecting some soft, cheap material. What would be thought of a nurseryman who would place his best trees on the top of a box and then knowingly and deliberately crush them with the cover, or a shipper of Strawberries or other fruit who would thus act? We do not think there is anything else in the world packed in this absurd manner. To pack Apples as we have recommended is not an expensive work, for it can be done for ten or fifteen cents a barrel, and if the fruit is choice and valuable, something is gained in the packing, for a less quantity is required, to say nothing of its greater value in a foreign market.

A shipper recently informed us that he thought the persons to whom Apples were consigned were not honest, because they complained of receiving Apples in bad condition, while friends to whom the same kinds, packed in the same manner, were sent, made no complaints. There may be some truth in this, but friends to whom we make presents are not apt to complain.

We know of one gentleman who shipped a barrel of very choice Spies for which $25.00 was offered, while the ordinary American Apples were selling for about $3.50. We know of another barrel that attracted special attention, and a plate was asked for a dinner party by a member of the royal family, to grace a dining-table at which the Prince of Wales was to be a guest, and another dish graced the tables at the Lord Mayor's annual banquet. We mention these facts only to show how highly choice fruit is appreciated, and to induce American growers to produce fine fruit, and pack honestly and with care, knowing that in such a course there is both honor and profit.

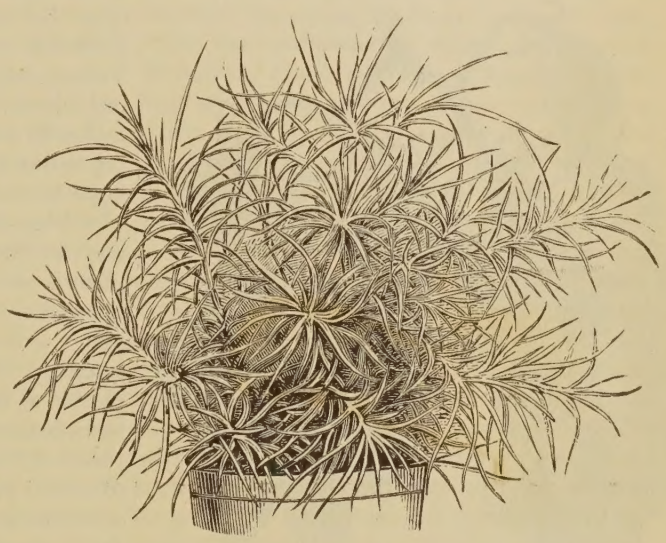
WINTER-FLOWERING CARNATIONS.

Flowers are lovely at all seasons of the year, but particulary so during the winter time, when everything without is cold, barren and lifeless. The Rose bud is then more fragrant, more beautiful than at any other time, and is more satisfying, and attracts more attention, and causes greater delight than a whole bouquet in the sunny summer season. Of all the flowers

grown by the florist for the pleasure of the people, and for an honest penny, none is more useful, and indeed we know of none so much so, as the winter-flowering Carnations. In a previous number of the MAGAZINE we gave a description of the garden Carnations, and these are the rivals of the Rose in both beauty and fragrance. They bloom, however, only in the summer season, when flowers are abundant. Fortunately, we have a class of Carnations that are called winter-bloomers, but are really constant bloomers, and with a little management during the summer, will flower abundantly all the winter, furnishing more flowers than any plant we are acquainted with. It is upon them that the florist mainly depends for winter use, as they form the base of nearly all floral ornaments. To the amateur they are equally valuable, and can be obtained at little cost, and kept with ordinary care.

The best plan is to obtain small plants in the spring and set them in good soil in the garden, or in large pots, which should be sunk below the rim in any good place where there is plenty of air and sunshine, and not in the shade or near trees or shrubs. Before midsummer they will show a disposition to flower, when the flowering stem should be cut back to the first bud below the top. This course must be followed through the summer as often as buds form. The plants thus treated will throw out numerous branches and become strong and compact, and in July or August will appear like the first engraving. Later in the season, early in September in this latitude, plants will have the appearance of the second engraving, while buds will form abundantly. If set in the ground the plant should now be potted, or if in pots, repotted, with a little fresh soil, and placed in the house. Before potting, it is well to remove a portion of the buds, though, if flowers are desired early in the winter and the plants do not appear to be over-crowded with buds, the greater part may be allowed to remain. After potting, place the plants in a cool, shady place for a few days, until they recover from the effects of the removal, though Carnations are easily handled and suffer little from transplanting. Thus treated, they will give abundance of flowers through the winter, unless the room where they are kept is fearfully hot and dry. Give as much air and sunlight as possible, and if flowers are not needed for use, remove them as soon as they begin to fade.

Our colored plate shows six of the best varieties of winter Carnations. The two center flowers are La Purite and La Purite variegata. The flower with a strong pink tint, Hinsdale; its neighbor at the left, Snow White, and below, Peter Henderson; the variety at the left of the picture, somewhat in the shade, the old



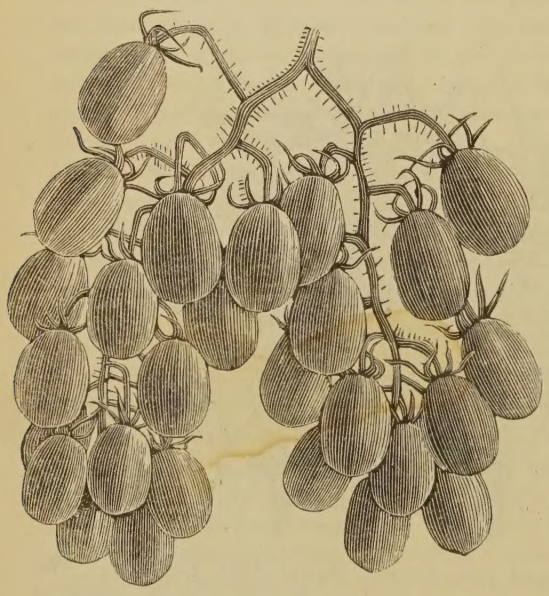
and long favorite flower, Pres. DeGraw. The drawings were taken from specimens grown in the house the present winter, but hardly do justice to these elegant flowers, for we miss their delightful fragrance; we also miss a good deal of beauty. Many think artists exaggerate and flatter; this may be true of the painter of portraits, but no artist yet truly painted the flowers or the rainbow. There are many flowers that we can-

not show in colored plates, and all attempts to do so have proved failures. Art has discovered no colors that vie with the tints of the flowers. The poet realized this when he wrote

——"Who can paint
Like nature? Can imagination boast
Amid its gay creation hues like these?
Or can it mix them with that matchless skill
And lose them in each other, as appears,
In every bud that blows!"

TOMATOES.

The Tomato has greatly improved in size, smoothness and quality within our recollection. It has also changed from a mere ornament, like some other Solanums, to an article of necessity and general use in this country, while it is working its way steadily but surely to favor all over the civilized world. In a cool, moist climate, like England and Scotland, the Tomato ripens in the open ground only under the most favorable circumstances, and seems to require about such treatment as the Peach. Tomatoes are, therefore, grown in houses, like foreign Grapes, trained to the rafters. Those who have had no experience can scarcely realize how large a plant the Tomato will make when a little pains is taken in giving it plenty of nutriment and proper training. Once we trained one to the side of a building, and it covered a space sixteen by twenty feet, and had



several hundreds of ripe fruit at one time. It seemed a marvel to many, and we had plenty of applications for seeds, on the supposition that it was a new and improved variety.

Some years since we sent the Hathaway Excelsior Tomato to England, and it has proved for many years the most popular variety in that country. From it, by some freak of nature, was produced a kind called Green Gage, yellow, oblong, small, but rich and productive—too small for market purposes here. Later we sent a new variety which we had not named, and which received a first-class certificate from the

Royal Horticultural Society. Our friends in England named it Vick's Criterion. This, too, has become a leading and popular sort, and, it is claimed, exells all others for forcing. From this, "RICHARD NISBET, a gardener at Aswarby Park, has produced a variety called Nisbet's Victoria, which is said to excel all others for fruitfulness. The fruit is oval, less than two inches by two and a half in diameter. Growing in bunches, and each bunch containing from eight to twenty specimens, of the size and color of a Victoria Plum. It contains but few seeds, and for flavor is unsurpassed. The original plant covers a space fifteen feet by six, and had upon it at one time 600 bunches of fruit, as many more having been gathered during the summer. We give an engraving, showing a cluster of this Tomato, much reduced in size, and also a view of a Tomato house filled with plants of this variety, taken from a photograph." We shall give this a good trial next summer, but think it may be too small for general use in this country, where Tomatoes grow so abundantly in the open ground, of great size and wonderful beauty. The descriptions and engravings are from English journals, and we notice in the last number of the *Gardeners' Chronicle* a correspondent, at Tweedside, declares "Vick's Criterion Tomato is one which outstrips all other sorts both in quality and quantity of produce."

CLUB-ROOT IN CABBAGES.

The acceptance of a well-established theory, as a theory, is often of great benefit, leading to important results, and sometimes to its own verification. But the acceptance of a theory, as truth, is often pernicious, and always closes the door to further discovery and improvement. Scientific investigation has often been assisted by a good theory, but many instances might be given to show that by the same means it has been greatly hindered.

We are led to these remarks by reading an interesting communication, bearing the title at the head of this article, that lately appeared in a leading agricultural journal, over the signature of our very able co-laborer, PETER HENDERSON. Mr. H., in his practice, has had much experience with club-root, and, probably nobody better than himself understands the proper mode of dealing with it. He states that there is a large section of land used for market-gardening lying along that portion of the Atlantic coast known as the Bay of New York, for nearly a mile inland from the shore, and which at some time has been covered by the waters of the bay. The soil of this section is mixed with oyster shells to the depth of a foot or two, and Cabbages have been raised on it for the last thirty years, and among them all there has never been known a case of club-root. This is a plain and satisfactory statement of a fact, and is corroborative of the claim frequently made of the value of the application of lime to the soil for the prevention of this affection. In reference to the application of lime, Mr. H. says: "We find that by using heavy dressings of lime in the fall, sowed on thick enough to whiten the land completely, and lightly plowed but deeply harrowed in, we can secure crops of Cabbage successfully; but unless we do so we cannot, except where the lime is naturally in the soil, from the oyster-shell deposit."

Such unquestionable facts as are here given make it conclusive what we are to do to avoid club-root in raising cabbages. No less decisive facts are also given by Mr. H. as to what we are not to do. We are not to take the risk of raising two successive crops of Cabbage on the same ground. Mr. H. says: "On lands having no oyster shells in the soil, just so certain as we plant Cabbages twice in succession on the same ground, just so certain does club-root follow, no matter how healthy or luxuriant such plants may be, or whether they are grown in our own locality or procured from a distance. So well marked is this fact that I have seen again and again, when setting out Cabbage plants, that when, by accident, a line of Cabbages had been set on the bed that had grown Cabbages the previous year, that line was destroyed by club-root; while the others, that had followed after Beets or Onions, were completely exempt from the disease."

The facts contained in these statements are well known. Mr. H., in his valuable book, *Gardening for Profit*, published them several years since, and they have governed the practice of all the best cultivators in the country. The intelligent physician, however ably he may be able to treat a disease by its symptoms, is not satisfied unless he can positively demonstrate its cause; he may be obliged, for a time, to resort to an hypothesis, but, if an original investigator, he never loses sight of its real character, or fails to detect its weak points. Oddly enough, Mr. H., with his practical application of facts, appears to rest contentedly with a suppositious cause of club-root; he supposes it to be an insect, but does not adduce a single fact in its support.

On page 278 of our last volume we gave the substance of some investigations recently made by M. WORONIN, a German scientist, that are thought to indicate with certainty a fungoid origin of club-root. M. WORONIN says, "insects are merely accessory, and it is an error to attribute the cause to them." Mr. H. says, "that the 'authoritative microscopic botanist, WORONIN,' found the roots of fungus on Cabbage affected by club-root I have no reason to doubt, but if he had had an extensive practical experience among plants, he would have known that the fungus which he found was a *consequence*, and not the *cause* of the disease."

We do not know what practical experience could have afforded the knowledge here claimed. Mr. H. has, in none of his writings, given any proof of his position that the affection in question is eaused by insects, although he has always assumed it. We have no reason to expect that practical experience will ever apprise us of the cause of club-root; it is not within its range; light upon this subject may be expected only from the patient investigations of scientific men. Although many entomologists have studied and described the habits of the insect that accompanies diseased Turnip roots, and have supposed the insect might cause the affection, and have also supposed the similar disease in Cabbage roots to be caused by the same insect, yet they have never established that position. M. WORONIN'S observations come very near a demonstration of the fungoid

origin of the affection. His examinations were made successively upon healthy specimens and upon those having the disease in every stage of development. He showed that the disease made a very considerable progress before there was any outward sign of it; he showed that, by the aid of the microscope, its first appearance is detected by some of the cells of the parenchyma of the bark being filled with an opaque, granular substance, and that these cells are rather larger than the neighboring ones; an examination of the more diseased sections showed an increase of this granular substance. Some cells were found to contain a number of minute, colorless, spherical bodies. The granular substance was the body of the fungus, and the spherical bodies the spores. The spores were so minute that it would require sixteen hundred of them laid side by side to measure an inch. No appearance of a wound or puncture caused by an insect or its larva was discovered, and there is, therefore, no pertinence in the remark of Mr. H., although very true, that "diseases on vegetation, whether from wounds produced by insects or from any other cause, are almost invariably followed by fungoid growth in some form or other." Nor is there more relevancy in the following method of explaining M. WORONIN'S facts. "Bruise an Apple, a Turnip, or a Potatoe, and in a greater or less time, according to the temperature in which it is placed, you will find in covered with 'mould;' apply the microscope and you will surely find a fungus fattening on the decay, but the bruise or wound was the primary cause of the evil, just as the insect boring into and wounding the Cabbage root made a suitable soil on which the spores of WORONIN'S fungi germinated."

As already stated, the fungus was revealed when the root was apparently healthy and without any appearance of a wound. Certainly the work of a larva would have been discovered with a microscope if it had existed. We accept the statement of facts made by Mr. HENDERSON, do not let us depreciate those of M. WORONIN; both are good, and with further developments may be found to accord. It is to be hoped that skilful entomologists and microscopists in this country may give some assistance in the investigation of this interesting subject; for it is only by accurate observations that we may hope to discover the cause of this annoying affection that has long remained hidden, and that yearly causes so much loss and disappointment. It will make the reputation of the one who reveals the secret, and among gardeners, at least, he will be considered as a benefactor of his own and succeeding times.

A BEAUTIFUL BASKET-PLANT.

The finest hanging baskets we have ever seen have been of single plants of the Ivy-leaved Geranium. The richness and elegance of the foliage and the drooping or trailing habit of this plant are qualifications it possesses, rendering it eminently serviceable for baskets and vases. One plant is enough for a basket, but, except in rare cases, it will require more time than is afforded the first season to show in its best condition. The plant is easily kept over winter, and the second season, if attention is given by the use of manure-water to sustain it, the growth will be exuberant. There are now

IVY-LEAVED GERANIUM, KŒNIG ALBERT.

so many varieties of this plant that one has the opportunity to indulge his taste in selection; there are golden yellow-leaved ones, bronze, green with white margin, and one, L'Elegante, that has its green leaves margined with white that is tinged and streaked with pink. The colors of the flowers are different with each variety; there are scarlet, and crimson, and rose, and pink, and white; again there are single and double flowers.

One of the best varieties for a hanging basket, on account of its fine foliage and free growth, is the double-flowered sort, Kœnig Albert, having mauve, or purplish lilac-colored flowers. The double flowers last much longer than the single ones, and this adds much to the value of the plant. For large baskets, where the best effect is desired in a short time, several of these plants of different kinds could be used for the margin, with other plants in the center.

PLANTING IN BOTANICAL GROUPS.

The difficulty of arranging a collection of plants so that they will present some classification and botanical sequence, and at the same time be picturesque, has always been recognized, but rarely overcome. There are those in America and England to-day who say the difficulty lies in finding "suitable positions for particular plants;" but a skillful gardener very frequently finds himself compelled to make positions, and when they are made for him beyond modification, he has just as frequently to find plants to suit them. This is always so in climates where artificial means are either impracticable, or but little resorted to.

Trees, shrubs, herbaceous plants, and annuals have been arranged by themselves repeatedly, and classified both after the method of Linnæus and that of Jussieu, but have been so little productive of ornamental effect that the idea seems to have stereotyped itself into many minds, that the term classification, as applied to a garden, means unmitigated ugliness. The leading ideas with the designers of these arrangements has been instruction, and the collection of a large number of species. Selection has not been dreamed of in any botanical garden of the past or the present, consequently, all such gardens contain much of what gardeners call "rubbish."

But there is no necessity for these things; classification may as well be carried out with well chosen and carefully selected material, as well as with all the "interesting" weeds which come uppermost. The greatest difficulty in all arrangements has been that the plants followed each other in a series of genera or orders, each one of which was quite different from the preceding one in the size and habits of its members. This was thought to neccessitate the planting of trees, shrubs, and herbs, each separately; but that only partially remedied the evil.

Now there is no need that a genus or order should be considered a unit in these arrangements. If the fact that one order is almost entirely trees, and the succeeding one entirely herbaceous plants, interferes with the serial presentation of natural groups in a picturesque garden, then some other method must be adopted.

The engraving represents grouping by alliances, or cohorts, planting in the gardenesque or modern style, very carefully selecting the showiest representation of the alliances, and, as far as may be, of the orders they embrace, and planting the flowering shrubs and other plants in masses and groups of beds. There will be found plants which do not succeed well in particular climates and soils; sometimes this may extend to a whole genus, order, or even alliance of orders. Take Ericales for instance; there is usually trouble with such genera as Erica, Rhododendron, Kalmia, Andromeda, &c., often necessitating the abandonment of their culture, but the alliance may be represented in its appropriate place, during summer at all events, if only by groups of Indian Azaleas, which are usually disposed of out doors at that season. But there are numerous localities where better than this can be done, especially where such plants as *Oxydendrum arboreum*, *Vaccineum arboreum*, and other arborescent forms thrive; these may be planted in masses for the creation of shade, and the Rhododendrons, &c., planted beneath them as undershrubs, edged with Azalea or other desirable representative plant. Ericales could be represented thus, and made to exhibit perhaps four or five natural orders within the limits of a very ornamental group. And so with nearly all the alliances that are easier to select material for; there is no real difficulty in rendering them ornamental, and they are quite as instructive in that shape as otherwise. The orders, genera, and species constituting an alliance have some characters in common, with as much diversity of aspect as the most exacting artist could wish. Taking the plants under cultivation at only 20,000, this gives an average of nearly 385 species to the alliance, and a large percentage of these may be used, planted

out during the summer. Practically less than 1,000 species and their varieties would furnish material for such a plan as the one given, and much of the effect would depend upon massing individual species in the foreground.

In temperate climates, such as those of the United States, Europe, and parts of Asia, the monocotyledonous division of plants present few arborescent forms; in the cold temperate regions, hardly any; but they may be well represented out doors during summer, wherever a good conservatory is maintained, and labor can be afforded. The Banana, the Strelitzia, the Travelers' Tree, the Palm, the Pandanus, the arborescent Yuccas and Aloes, the Bamboo, and the Cyperus could all be usefully employed for the lightening up of the Conifers during summer. Their tasteful selection and disposition would depend upon the knowledge and skill of the gardener; no mere laborer could be entrusted with such details.

There is, perhaps, nothing more necessary in American gardening than some system which will stamp it with individual and striking character; something which will be distinct from the prevailing features of the surrounding country. Too many of the artificially planted grounds partake too much of the native woodland type, and differ scarcely at all from anything which may be seen anywhere east of the Alleghanies.

The clump and the single tree constitute the all pervading woodiness of the American landscape, and the mixture of species is much the same from the Lakes to the Gulf, except that, far south, a few broad-leaved evergreens appear.

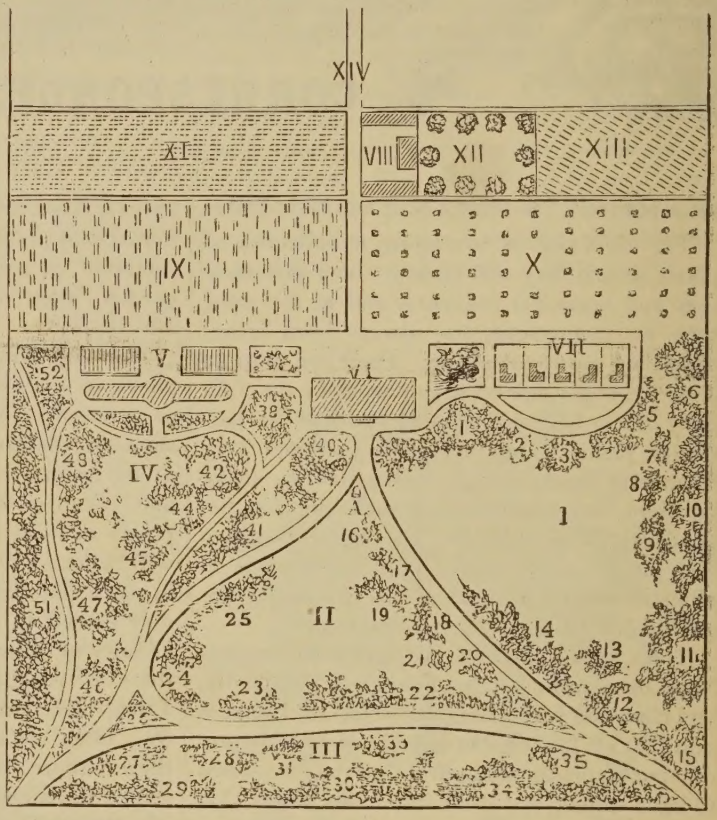
The circumstances here are not as propitious for the wild-garden as in England; there, everything planted is intensely artificial; straight hedges and rows of trees are a feature all over the country. Here the very reverse is the case, and to be striking and effective, too much art cannot possibly be concentrated in the garden. —JAMES MACPHERSON.

IV. Coniferæ with Monocotyledonæ grouped in the sub-tropical style during summer.

V. Conservatory, propagating and nursery houses, and parterre in front.

VI. College building, with vacant ground behind for future extension.

VII. Professors' residences, with open lawn in front.



PLAN OF GROUNDS FOR AN AGRICULTURAL COLLEGE. SCALE 55 ft. to ⅛ in.

VIII. Farm buildings.

IX. Ground for nursery, small fruits, and winter-blooming plants.

X. Orchard.

XI. Culinary garden.

XII. Compost ground, &c.

XIII. Experimental ground.

XIV. Farm.

A. Ornamental vase.

REFERENCES TO PLAN.*

SECTIONS.

I. Polypetalæ.
II. Monopetalæ.
III. Apetalæ.

DICOTYLEDONS.

Section I. Polypetalæ.

1. Ranales.
2. Parietales.
3. Polygalales.
4. Caryophyllales.
5. Guttiferales.
6. Malvales.
7. Geraniales.
8. Olacales.
9. Celastrales.
10. Sapindales.
11. Rosales.
12. Myrtales.
13. Passiflorales.
14. Ficoidales.
15. Umbellales.

Section II. Monopetalæ.

16. Caprifoliales.
17. Asterales.
18. Campanales.
19. Ericales.
20. Primulales.
21. Ebenales.
22. Gentianales.
23. Polemoniales.
24. Personales.
25. Lamiales.

Section III. Apetalæ.

26. Chenopodiales.
28. Daphnales.

27. Laurales.
30. Amentales.
31. Euphorbiales.
33. Asarales.
29. Urticales.
34. Quernales.
35. Santalales.

Gymnospermæ.

All the hardy Conifers, are designed to be supplemented during summer with such Cycadæ as are in the collection, and Gnetaceæ where they are available, and are to be planted upon section IV with the Monocotyledonous plants. In all northern regions, the Conifers only would appear, except for a few months in the warm season.

MONOCOTYLEDONS.

Section IV. Monocotyledons.

38. Amomales.
40. Taccadales.
41. Narcissales.
42. Dioscorales.
44. Potomales.
45. Palmales.
46. Arales.
47. Liliales.
48. Pontederales.
51. Glumales.

ACROGENS.

52. Filicales.

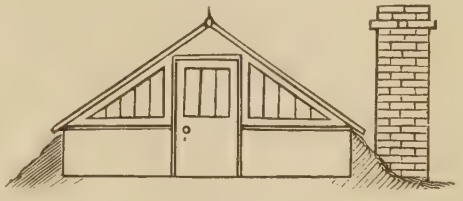
As in section IV, for the purpose of effect, liberty has been taken to group the endogenous plants with the Conifers, so in planting the piece of ground devoted to the Ferns and their allies, any small trees and shrubs may be introduced that are necessary to produce shade and shelter for the plants that are strictly appropriate to the place. The use of such woody plants would be at once apparent to any careful observer, and could never mislead in respect to botanical relationship.

* The grounds are divided into sections indicated by Roman numerals. The sections I, II, III, IV, are devoted to the great divisions of Flowering Plants arranged in groups, numbered from 1 to 51, representing the Cohorts or Alliances according to the arrangement of BENTHAM and HOOKER. The names of these Cohorts, or Alliances, will scarcely convey an idea of what the groups are composed, to those of our readers who have given but little attention to the subject of botany. In order, therefore, to explain, we will state that group one, representing the alliance, Ranales, is formed of such plants as Aquilegia, Anemone, Pæonia, Delphinium, Aconitum of many varieties in beds, and clumps of trees and shrubs of Calycanthus, Magnolia, Liriodendron, or Tulip Tree, Berberis, and some tropical trees and shrubs, usually kept in the conservatory, but which may be removed to the grounds during summer; besides these, there are the Nymphæas, Nuphars, Nelumbiums, or Water Lilies, to be used when they can be provided for, as they easily may be when there is a supply of water; also the Menispermads, or Climbing Vines of the Moon-seed family. From the above only the faintest idea is conveyed how very rich in plants is this first group, and what abundant material the gardener has to select from; an analysis of many of the other groups would show as great a variety and wealth. In the disposition of the plants in the groups one is not tied to any formal arrangement; each plant may be placed where it will best produce a natural and picturesque effect. To effectively plant grounds in this manner is what many of the most advanced gardeners in different countries have from time to time striven in vain to accomplish. LOUDON, who comprehended the subject, probably, with greater intelligence than many others of his time, put his opinion on record in the following words: "The most perfect arrangement of species in regard to variety would be to employ every kind of tree and shrub that will grow freely in the open air, and arrange them according to the natural system. We have already suggested that a residence might be wooded in this way, so as in the smallest extent to obtain a maximum of variety and beauty."

Within the last half century a great advance has been made in a knowledge of the affinities of the natural orders of plants, and this enables us to group plants in a manner unknown to those formerly in the field. They were restricted by the close lines that define family relationship, and of necessity their attempts at grouping were awkward in the extreme; to us, in gardening, these lines are obliterated, and we are left free to exercise a great freedom of choice in the use of material; consequently, the method proposed by our correspondent, not only becomes possible, but is highly desirable on the large grounds of educational institutions and public parks.—ED.

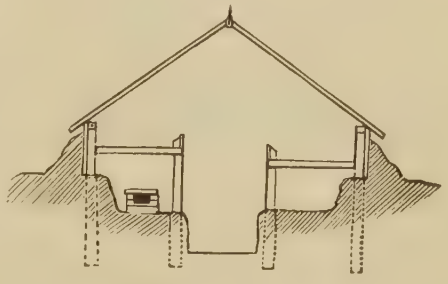
A CHEAP GREENHOUSE.

MR. JAMES VICK:—I herewith enclose drawings of the small greenhouse which I built last September, with cost of material. The cost of labor I cannot give any more definitely than to say I was busy at it about ten days, working about eight hours a day, besides three evenings



END ELEVATION.

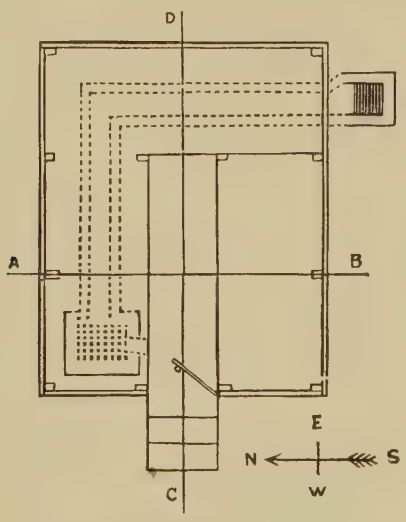
at the triangular sash for the ends. My purpose was to have some place where I could winter over a number of plants, from which, in the spring, I could propagate a quantity for bedding purposes. Heretofore I have had to content myself with a sitting-room window, with but indifferent success. Coleus, Achyranthes, and Alternantheras, of which I wanted the greatest quantity, were the ones with which I had the most difficulty. With this little house I am doing magnificently. It is twelve feet long by ten feet wide, the roof composed of eight ordinary 3 x 6 feet hot-bed sashes. Both ends are glazed, as shown by the end elevation, with the exception that in the east end there is



SECTION CROSSING GROUND PLAN ON LINE A B.

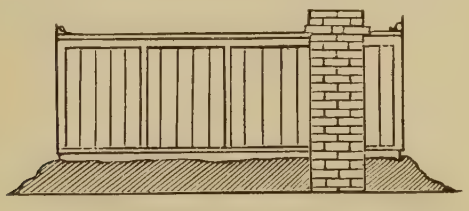
a window to correspond with the glazed part of the door. The furnace and flue is built of ordinary soft brick, (the furnace should be lined with fire-brick, but mine is not and will probably need renewing another year,) the sides and

top of the furnace two bricks thick. The flue is raised from the ground to the height of one brick set on edge, flat paving-bricks rbout 8 x 16 inches and two inches thick forming the top and bottom; ordinary brick, laid flat, two high,



GROUND PLAN.

for the sides. This makes the inside of flue about 6 x 7 inches. The furnace grate is 12 x 16 inches, but at present I have bricks placed inside, contracting the grate surface to 8 x 12 inches, and find this sufficient for all needs. The management of the fire is very simple. Should it threaten a cold night, I blow the fire a little and have the furnace and flue hot at the time I retire. I then close the draft, and next morning everything is nearly as warm as when I left it. Two or three nights ago the thermometer stood at 7° out doors; at 10 o'clock P. M., in the house, at 65°, and at 7 A. M. next morning at 61°. Directly over the furnace I have the cutting bed. Cuttings which I have found almost impossible to root before, root here very readily. I do not lose three cut-



SIDE ELEVATION.

tings in a hundred. One sash on each side of the house lifts for ventilation in the usual manner. The sides are double-boarded, with felted paper between, and then banked up with the earth which came out of the passage inside and the depression where the flue is laid. There is only one trouble. It is too small—I did not think I would have it filled before spring, but it is full now. I intend building on the west end this winter, and keeping the new part for Geraniums, Roses, and Carnations, and the part now running, for those plants requiring a higher temperature.

The following are the materials required, with their cost here:

8 3x6 hot-bed sash,	$1 80	$14 40
½ box glass 6x8 for end,	3 00	1 50
15 chestnut posts,	22	3 30
100 feet 3x4 hemlock, for plates, bench-frame, door-posts, &c.,	1 50	1 50
300 feet 1-inch hemlock boards, for double-sides, benches, &c.,	1 50	4 50
40 feet 4-inch tongued and grooved pine, for end boarding, door, &c.,	3 00	1 20
50 feet clear pine, for facing, end-sashes, strips, &c., per hundred,	3 00	1 50
500 soft brick, furnace and flue, per thousand,	5 00	2 50
200 hard brick, for chimney,	6 00	1 20
60 paving brick, for top and bottom of flue, each,	02½	1 50
½ bbl. cement	1 50	75
Sand,		20
Hinges, lock, hooks, nails, screws, paint, putty,		2 00
Grate,		1 00
Total,		$37 05

SECTION CROSSING GROUND PLAN ON LINE C D.

Next spring I will drop you a line telling you how the little house has worked during the winter.

The bound volume of your MAGAZINE for 1878 was received safely; I think the volume for 1879 the better.—L. H. D., *Roysfield, N. J.*

From the above statement our readers will learn at what small expense a servicable greenhouse may be constructed. To fit this house up with cast-iron boiler and pipes for heating with hot-water would cost $100 more. It would then be very efficient, and still cheap. This house stands lengthways east and west. For most localities in this country it would be better to stand north and south, and to have the furnace in the northwest corner, and the flue run along on the west, south, and east sides, with the chimney at the northeast corner, or, if pipes are used, to have them pass all around, and the chimney stack could then be at the north end. By this arrangement, the sunlight and the heat from the furnace would be distributed most evenly.

DWARF PEAR TREES.—At a recent meeting of fruit-growers in Newark, N. J., Dwarf Pears were generally condemned, yet Mr. FULLER would risk them for profit in a ten or fifteen year race and win. My experience in this section is they are valuable for garden culture.—S.

BEGINNING IN FLOWER-CULTURE.

MR. VICK:—As you seem to take an interest in every one's cultivation of flowers, perhaps you would like to hear of our success. We have been living out of the city, where we could gratify our love of flowers, only two seasons. Last year we were able to get only a few annuals, but our grounds, which are quite large, were bright with an abundance of handsome Petunias and Phlox. We had also quite a collection of pot-plants on our porches, nearly all of which we lost last winter. This year we had plenty of time, and with seeds, and bulbs, and plants we made quite a display, for beginners. We had fifty species, including several varieties of many of them, in bloom at one time. We made it a point to get as many long-blooming plants as possible, among which were Geraniums, Begonias, Fuchsias, Sweet Alyssum, Verbenas, Dianthus, Lobelia, and Ageratum.

Of course we had a number of failures to sober our successes, such as the loss of our Myosotis and Lychnis from want of water; our fancy-foliaged Caladium did not do well either. We were particularly successful, and consequently pleased, with Petunias, Pansies, Zinnias, Cockscomb, Sweet Alyssum, and Lobelia. We used Sweet Alyssum as a border for a Verbena bed, and also for a bed containing Dwarf Larkspur, Balsams, and Gladioli. Nothing could be handsomer on the green lawn than a fragrant, white oval filled in with delicate shades of red. My Sweet Alyssum basket was not as handsome as the ones you have pictured.

I do not think you have appreciated, at least you do not tell people, the value of Zinnias for certain purposes. Our grounds rise gently from the road to the house, and as our choice flowers, being near the house, could not be seen from the road, we determined to make beds of hardier plants through the lower portion. In these beds we put quite a variety of plants, but found that a bed containing a Ricinus and Zinnias was the hardiest and handsomest. The Zinnias were as double as Dahlias, and the coloring as delicate and various, when seen from the distance from which they were intend-to be seen; besides, they were a mass of blossoms from early summer until freezing. Several persons say they never saw any as handsome before.

One thing which pleased us very much was the attention and compliments paid our flowers by neighbors, and country people in general. Those who live in the country are the ones to cultivate flowers, because their facilities are so much the best; but, nevertheless, it is a rare thing to see a pretty yard in the country—here, at least. This is not due to a lack of appreciation of pretty things, not to lack of industry, but to ignorance of the way to make the means serve the end. Many will have very nice flowers, indeed, quite choice ones sometimes—in the corners of the kitchen-garden, behind the house. Imagine Tuberoses and Onions growing side by side! If not so bad as that, they will have their beds filled with pretty flowers for a short time in the spring, and with weeds the remainder of the summer. In placing our plants, we studied their characters from the FLORAL GUIDE, and used all our ideas of symmetry and harmony of form and color. We aimed to make the most of every plant. I am glad that a correct knowledge of flower culture is being gradually disseminated through the neighborhood.—E. F. L., *Columbus, O.*

REPORT FROM THE FRONTIER.

MR. VICK:—The FLORAL GUIDE came to hand a few days since, and was, I assure you, most welcome. We have learned to look for its coming as for an old friend; for, though ever new, it is an old friend to us. We have been a patron, I think, for twelve years—first, from Mystic Bridge, Conn., later, from Lyndon, Ill., and now from far-away Kansas. Failing health drove me from our much loved home, our large circle of relatives and friends, and from my chosen profession, teaching, to earn my bread by the sweat of my brow, in a land to my boyhood unknown. I came here a year ago last August, and soon feeling much stronger, with a "coming appetite," I bought sixty acres of land near the City of Caulker, built a house, and then sent for my wife, and "moved in" New Year's day, 1879, and from that time we are a farmer. I laid out three-quarters of an acre for a garden, carted on sixty loads of manure, plowed and harrowed, and harrowed and plowed, 'till every mule that passed would stop to laugh at me—they had learned it of their drivers. The idea of manuring land especially for a garden, seemed to the average Kansas man the height of folly, and the oft repeated "I reckon, stranger, you'll be disapinted," seemed to echo in the air. But the laugh and the disappointment changed base long before fall, for I did have a splendid garden, and the "I reckon, stranger," was changed to "I say, boss, whar did you get your seeds?" and if one-half to whom I have given your address send to you for seeds, you will have quite an increase of patronage from Kansas. Last year I could get all the manure I wanted, even of the farmers, for the carting, but this year I cannot buy of them, and am carting from town. Last year I broke twenty-three acres, and this year I want to break all but ten acres, and I

think I can do it, for I have three good horses and a set of riding plows.

I saved several samples of wild flowers, but in looking over the GUIDE I find you already have the most of them. But I do not find one of them. I think it is a species of Lantana, which is very beautiful and delicate. It is semi-vinous, with many branches ranging from one to three feet in length, with bright, green skeleton leaves; very attractive. The blossoms are separate, but profuse; magenta color, perfectly round, and about one inch in diameter. Of all the wild flowers I have seen here, this is the most delicate and attractive. The Sunflower, Spider Lily, Oxalis, Verbena, Geranium, Callirrhoe, *Euphorbia marginata*, the finest I ever saw; Wild Peas, and many other wild flowers grow here in all their native beauty.

I want Ruhlman's hand cultivator in my garden, but most of all among my wheat. I want to drill my wheat sixteen inches, and this would be just the thing to hoe it with. My success in the garden last year was in using the hoe instead of the corn-plow, as the season was rather dry. Some of my Beets were twenty inches in circumference, and I had Carrots twenty-eight inches long. This is the best soil for a garden I ever saw. It is as mellow as an ash-heap, and the soil is from two to three feet deep. My garden is by the side of the main thoroughfare for immigrants from Iowa, Wisconsin and Minnesota, and it is a regular standing advertisement.—W. W. N., *Cawker City, Kansas.*

A CURIOUS PLANT.

MR. JAMES VICK:—The *Cyclanthera explodens*, or as it is often called, the Exploding Plant, is a curious and interesting plant, and one that always attracts the attention of an observing person. And, as I do not think that it is known and as extensively cultivated as it deserves to be, a few descriptive remarks on its use and cultivation may not be out of place. The Cyclanthera is a rapid-growing climber, with elegant foliage and curious, bell-shaped fruit. It prefers a rich soil, and a warm, sunny position to grow it to perfection, but it will do very well if grown in other positions, and it is an excellent trellis-plant. It is a tender annual, and attains a height of from twenty-five to thirty feet, if proper care and attention be given it. The term, exploding, is very properly applied to this plant, for the reason that the seed-pods burst open and eject the seed to a considerable distance as soon as the pods attain maturity. It is said that a loud noise accompanies the explosion, but whether this is true or not I cannot say, but I have noticed that they always burst open on a warm, and bright morning, after the sun has been shining on the plant for about half an hour or so. This is a plant of very easy cultivation; the seeds can be sown in a pan of well-drained, light soil, in a hot-bed about April 10th, in a cold-frame about April 20th, or in the open ground about the 6th of May. Care must be taken to set the seeds on their edges, and to keep the eye down, or else the seed will rot. If the plants are grown under glass, take care that they do not become drawn; pinch the tops of the plants if necessary, and plant out when all danger of frost is over. Where the plants or seeds are to be placed, the ground had better be dug to the depth of two feet and a good quantity of well-rotted manure worked in. I do not advise the use of this plant for baskets, or for vases in the open air during the summer, but for trellis-work it is worthy of trial. It is not subject to insects, and stands dry weather remarkably well. The flowers are small, yellowish-white, and not showy. It seems scarcely necessary for me to add that the plant is worthless for inside cultivation.—C. E. P., *Queens, L. I.*

FERNS FOR WINTER DECORATION.

MR. VICK:—Having gathered and pressed a quantity of fine Ferns last season, I have devised a method of preparing them for decorative purposes, which I think may be of interest to many of the lady readers of your MAGAZINE. It is the only effectual plan I have ever tried for preserving them in all their native gracefulness, and preventing them from curling and spoiling in the atmosphere of a warm room.

I first cut pieces of white tissue paper to any suitable size, and wax them with pure, white wax, to make them transparent. To do this, I melt the wax, and, having ready a warm, soapstone slab, or something similar, which is smooth and will retain heat, place a sheet of tissue paper upon it, and with a small piece of white cotton-flannel dipped in the melted wax go over the surface lightly, until it is completely saturated; then, with a dry piece of the flannel, go over the paper again while still warm, and wipe off all the superfluous wax. This will leave the paper transparent. Now, with a little warm starch and a small, soft brush, slightly touch the under side of the Ferns, and turn them over on to the waxed-paper, first having marked just where they are to be placed. Now, lay a smooth sheet of paper over the Ferns and slightly press them down with the hand. The addition of a few sprays of dried Grasses, if suitably arranged, has a very pretty effect. When completed, place them between the leaves of a book, or portfolio, until dry. They

can be put anywhere about a room, provided the background is light; but, when pinned upon lace curtains, the effect is most beautiful. The paper, being transparent, is scarcely discernable, and the Ferns appear as natural and graceful as when first gathered.— MRS. M. F., *Canandaigua, N. Y.*

ABOUT ZINNIAS.

Among all our annuals I do not know of any that better repays good culture than the Zinnia. It does not appeal to the heart and the imagination like the Tropæolum, the trophy-plant of the ancients, but it has its place in the garden, and, when kept there and well treated, is not to be despised. It affords pleasure to a large class of very worthy people who would hardly notice a Nemophila or look twice at a Myosotis.

Zinnias do not appear to the best advantage in masses; they seem to require toning-down, and look well in mixed borders, a row of Zinnias in the middle and other flowers at intervals among them and on both edges of the border. In a bed of this kind, the flowers should be really mixed and not planted, as I have sometimes seen them, in little squads of one sort by themselves. For instance, the

ZINNIA PLANT.

Mignonette should be set, a bit here and a bit there, the entire length of the border, and so with the others. Euphorbia, or Snow-on-the-Mountains; *Phacelia congesta*, a pretty, little blue flower, excellent for bouquets; Petunias, Drummond Phlox, Mignonette, Catchfly, Erysimum, Double Scabiosa, or Mourning Bride, or, as sometimes called, Widows' Flower; Snapdragon, *Centranthus Macrosiphon*, and Larkspur are all suitable flowers for this purpose; most of them will bloom until frost, if not allowed to go to seed, and thus there need be no break in the mass of flowers caused by some short-lived plant going out of bloom. As these are all hardy, excepting the Zinnias, and will sow themselves year after year without deterioration, such a bed would be really perennial.

Care should be taken to get the best seed, for a poor Zinnia is a very poor thing indeed. Do not depend on a neighbor, but procure it from a reliable florist, one cannot be too careful about Zinnia, Balsam, Aster, and Pansy seed. I lost considerable time and labor last spring setting out and cultivating a quantity of Asters kindly given me by a neighbor; they all proved to be single, and I pulled them up as fast as they came into bloom. Do not be discouraged if the first flowers should be only semi-double; break them off and have patience, and the next will probably be what you desire. If you pull up all plants that produce imperfect flowers, and save seed only from the best, you can have as good seed as the florists.

Zinnias may be grown as single plants on the lawn. When so grown, they should not be transplanted until in bloom, so that you may be sure of having a fine specimen. Then, if well fed and judiciously pruned, they will not disappoint any reasonable expectation, and will surprise all but the most sanguine. The Zinnia is tender, and seed should be sown in a hot-bed or cold-frame, or in boxes in the house; if sown in the open ground, corn-planting time will be soon enough. It is best to sow in a seed-bed and transplant. The colors of the Zinnia are varied and brilliant. The plant begins to bloom when quite small, and the blossom and plant go on increasing in size together until one resembles a little tree, and the other is almost as large as a Dahlia; the same flower remains fresh for a month or six weeks. Its perfect adaptation to our climate is a strong recommendation to favor; the Zinnia can always be depended upon, no matter what the season may be. Summer before last my Zinnias were very fine, notwithstanding the drought; and they were equally good this last summer, which was an exceptionally wet season. The Zinnia is a native of Mexico, and was introduced to European cultivators by Dr. ZINN, a German botanist, for whom it is named. Like the Aster and the Balsam, it is indebted to cultivation for its merits, being originally small, single and insignificant. Few would recognize the Zinnia of to-day as the Youth-and-age of their grandmother's garden, yet they are identical.—E. A. MATTIERS.

BRYANT'S LOVE OF HIS GARDEN.

In this month of February, now that the days are growing longer, we feel tempted to don rubbers and wrappers, and take a rake and gather up the rubbish that has lain under the winter snows. We cannot help thinking that BRYANT'S long life was owing in great measure to his genuine love of nature. He did not walk out for the sake of exercise alone, as many do, and consequently receive but slight benefit; he was happy in his rambles, having cultivated an intimate and close communion with every tree and flower. He found in natural objects charms and solace,—"Sermons in stones, books in the running brooks, and good in everything." His gardener relates of him, that he often tried to surprise him, and, for this purpose, would plant the seeds of some rare specimen of shrub or flower in some out of the way spot. But his ever-vigilant employer would invariably spy out the young sprouts just peeping above the soil, and, poking it with his cane, say, "Why, John, John, what's here? What does this mean? I have planted nothing here." Who can estimate the quiet happiness of his declining years! Who can tell what the ministry of flowers was to this great lover of nature in the last months of his life! What a charm in the society of such an old man, and how we could have loved him! We know that he, unlike many good old people, was not always thinking the world was growing worse and worse, and talking about the good old times. Let us learn a lesson of wisdom from his example. If on the down hill side of life, cultivate flowers, plant seeds in the spring time, water them, watch them, and you will soon learn to love the work. It will help beguile many a weary hour, and lift you into closer communion with Him who gave us richly all these things to enjoy.—M. H. S.

LETTER FROM AUSTRALIA.

MR. VICK:—Accept the compliments of the season. I have but little news to give you which would interest you. We have had an unexampled season, mild and genial; no extraordinary heats or north winds, although generally by this time delicate flowers have had a hard time of it. We have suffered much from blight this year among Roses—the blight, a kind of green aphis. A friend of mine informs me she was very successful in removing it by a vigorous spray of acetic acid, slightly diluted, thrown from a glass squirt.

Tulips are coming into fashion again, and when you are noticing that flower much interesting and reliable information may be obtained from DUMAS'S tale, "The Black Tulip."

Should there be any seeds that you wish to try, send me a line and I will try and get them for you. I have now some by me which I will forward as soon as I can. Should you have any one coming to Melbourne to the exhibition I would send a parcel by them on their return to America.

We shall have a grand harvest, both as to grain and fruit, and our floral display has been beautiful. Nearly all the Hoya and Cactus tribes have bloomed well this year, especially the latter; and some of the most ungainly-clumps have developed flowers of wondrous tones of color and delicacy of form. I am truly glad to find from a very considerable association with the masses, that the colonists generally are admirers of flowers, and there are but few homes, whether aristocratic or humble, but exhibit this taste in a greater or less degree, and our gardens, metropolitan and provincial, are something to be proud of.—S. W. VINEY, *Landhurst, Victoria.*

THE BALSAM.

Among the most beautiful flowers for culture on a veranda the double Balsams may well be chosen as one of the first. By keeping them to a single stems, and planting in rich soil, they may rejoice the hearts of all from June to November, in some latitudes.

Plant the seed in April, in a box, within doors, and set in pots or boxes in May, and they will blossom during the entire summer, if well watered and somewhat shaded during the heat of the day. The double white and pink are best for the heated term—their colors harmonize best with our feelings at that time. In August, plant seed of the double crimson, and they will come on rapidly and bloom until the cold destroys them. Their rich, warm colors are most grateful in September and October, and contrast finely with Asters and Phlox, which may be kept blooming to a late period, if well cared for.—M., *Oakley, S. C.*

TO DESTROY INSECTS.

I would suggest you to try the receipt given below for destroying Potato bugs, Squash bugs, and other insects. We have been very successin using it, and find it is but little known: One spoonful of coarse-powdered saltpetre to an ordinary pail of water. For Roses it is unsurpassed, and it invigorates all plants. For the maggots that work at the roots of Squash vines, pour about a pint of the liquid on the roots of each vine as soon as there are any indications of the presence of the little enemies.—E. S. G., *Bergen Point, N. J.*

INSECT AGENCY IN FERTILIZING FLOWERS.

That insects play an important part in carrying pollen from flower to flower and thus cross-fertilizing them, there is no doubt; the many observations made specially with reference to the habits of insects in this respect establish the fact unquestionably. Much, however, that has been written upon the subject had better have been left unrecorded, being conjecture, supposition and hypotheses. There is a great field here open to careful investigation, and what is wanted is an abundance of facts; these are undeniable—they form the granite foundation upon which rest the indestructible superstructure of natural law. With the insufficiency of facts of the operations of insects upon flowers, of which we are now possessed, it is probably premature to generalize to any great extent; consequently, we find those, who are even masters in their special fields, led into treacherous byways, when they follow their deductions on this subject with too narrow a range of view. A late issue of the London *Garden* says: "I fancy insect agency is talked of in a very unscientific way by too enthusiastic followers of Mr. DARWIN. I remember reading Professor RILEY'S dogma that the Yucca could only possibly be fertilized by a certain American insect, and being amused at it because I had seen it fruiting well at the south of Europe, and also in France. Probably we should see it oftener if we had a better climate. I now note what Mr. ELLACOMBE, writing to a contemporary, says: 'There can be no doubt that the Yucca can be fertilized by other means than by the agency of the Yucca moth, *Pronuba yuccasella*. I have more than once had well-formed fruit of *Y. recurvifolia*, but the seeds did not come to maturity. Dr. ENGLEMANN, in his *Notes on the Genus Yucca*, says: 'In the botanical garden of Venice I gathered the pulpy pods from a large *Yucca aloifolia*, about fifteen feet high. This was the only Yucca fruit seen by me in Europe, though I have since learned that in other instances, also, though only exceptionally, fruit and good seed have been produced there, principally by the same species, and very rarely by others.'' I remember the late Mr. BARILLEE telling me he had raised a great many varieties of *Yucca gloriosa* from seed saved in France. However, this mistake on the part of so good a man as RILEY is good sense compared with what we read on this side as to the influence of insects on the color and odor of plants. The statement by Mr. WALLACE, for example, that showy flowers are scentless, because from their color they are sufficiently attractive to insects, may pass for science with some innocent people, but it seems foolish to those who know even only a few garden plants."

GARDEN SLUGS.

The plan of using bran to trap slugs is, probably, the best of any yet tried. The slugs are very fond of it. In the words of an English gardener, "they seem to scent it from afar, and troop to it from every lurking place round about. For weeks past I have placed little heaps of it (about a small teaspoonful) anywhere and everywhere among the flower borders and rockwork, on every vacant space of soil. This I do about twilight, and then two or three hours after dark I go out with a light and a pail containing some salt and water. I have found as many as from twenty to thirty on a heap, which are gathered up, and thrown into the salt water. Death seems instantaneous. As it took some little time picking them up from the soil, I hit upon the plan of laying down small pieces of broken slate, three inches or four inches square, and placing the bait in the center. This enables the whole to be lifted up, and the slugs swept off at once into the water. On going round to gather up the slates the following morning, I find many more hiding under them. By keeping persistently to this plan for some weeks, I have produced a sensible diminution in their numbers. I have found slugs, snails, woodlice, armadilloes, and wireworms all dining together, like one happy family.

COLD FRAMES.

Few people who have only cultivated plants in the open ground have any idea of the usefulness and interest attached to the cold-frame. To those whose means will not admit of keeping a greenhouse, and who yet desire some facilities to enable them to cope more successfully in the continuous weather-battle, we can advise the use of a cold-frame. It forms one the nicest places imaginable for the wintering of a great many plants that are almost hardy, but still need some protection. In the spring vegetation starts in the frame several weeks before it can in the more open ground, and one can thus very sensibly lengthen the season of growth and bloom. The expense is only the first cost of sash and frame; there is no fuel to be purchased, no expensive repairs to be made, and no constant attendance required. To be sure, some skill is necessary, but that will be learned as one continues his operations, and it will be long before the capabilities of this piece of garden apparatus is exhausted. A practical gardener says: "I am trying a number of herbaceous plants (the hardiness of which I have had some doubt) in cold-frames and unheated pits. Many plants are presumed to be hardy, such as *Aquilegia grandulosa*, *A. cœrulea*, *A. chrysantha*, &c., but none of them will do well, even if they live through the winter in the open borders. But how very satisfactory when grown in pots! Our plants are now, and have been all through the late severe frosts, in an unheated pit; the pots are not even plunged, so that the ball of mould in which the roots are has been a mass of ice. *Primula amœna* and its varieties were placed in exactly the same circumstances without sustaining any harm. I need not say that all the fine Auriculas and Alpine Primroses have no other protection. The pots stand on a lattice-work trellis, which allows the air to circulate under and over them. *Trillium grandiflorum* is another most beautiful plant that should be grown in pots to produce flowers before the same plants do so out-of-doors. The delicate pure white blossoms of the St. Bruno's Lily, *Anthericum Liliastrum*, are charming when grown in pots under glass. The large number of beautiful and interesting plants that can be grown in pots in cold frames would surprise many who have hitherto devoted most of their resources and the space in their greenhouses to scarlet Pelargoniums. The culture which such hardy plants require is of the simplest kind—consisting in giving plenty of ventilation, removing the frame lights in fine weather, stirring the surface soil in the pots, and pressing such plants in as have been loosened by the frosts."

These remarks are very practical, but they give only a glimpse of the usefulness of the cold-frame, which will be more appreciated as it is better known. The Aquilegias, however, grow with wonderful vigor in our open borders.

KOHL RABI.

This plant has as yet made but little progress in establishing itself in the kitchen garden in this country; not but what it has valuable qualities, but because with the great variety of excellent vegetables already in cultivation, we are slow to discover the merits of a new one that under many circumstances is not specially needed. Still, a variety is always desirable, and in the selection for our garden provision should be made for the contingencies of the weather and possible losses by insects. A writer in a late number of an English journal says: "Though this is generally thought to be a farm rather than a garden vegetable, there are two varieties of it worthy of extended culture in gardens, viz.: the Early Green Vienna and the Early Purple Vienna, both of which attain a moderate size only, and the bulbs, if used

when about as large as a medium-sized Turnip, make a fine substitute for that vegetable in a season when, through drought or fly, these have failed; and in this consists the desirability of their culture, as they never fail in the dryest season, or are ever attacked by insects. At any age or size the bulbs are invaluable as sheep or cattle food, but worthless for culinary purposes when larger than the sizes just mentioned, as they then develop an astringency and toughness akin to that of Turnips in a hot, dry season. Soil of a light sandy character suits them best, but in this they are not fastidious, provided it be deeply tilled and well manured. Sow at any time from middle of April to midsummer, in drills eighteen inches apart, and thin out the seedlings, as soon as fit to handle, to nine inches apart—the seedlings transplant with but little check."

Besides the varieties mentioned above, the Large Early Purple, and the Large Early White are excellent for the table. The Early Green Vienna is the same as what is known in this country as the Early White Vienna.

PLANTS RECEIVED BY MAIL.

I wish you would tell us how to manage plants that are received by mail. I have had some sent several times that arrived in good order, but through my mismanagement were lost. The roots are firmly compressed and wrapped in moss. Must the moss be taken off and the roots loosened or soaked in water? Do the plants need to be put in the sun or the shade after potting?—Mrs. S. F. B., *Rockville, Mass.*

It has been found by experience to be a great benefit to plants that have passed through the mails, to place them in tepid water for about half an hour after they are unpacked. When received, the plants should be removed from the packing, the remaining soil gently shaken out from the roots, and then plunged in the bath as mentioned. Afterwards, remove from the water and allow for a short time to drain. Now, having on hand some pots and suitable potting-soil, repot them by first placing in the pot a small quantity of soil and then resting the ends of the roots upon it, spreading them as much as possible, and filling the soil in carefully between the roots and above them, just over the crown of the plant. After this, give a gentle watering with a fine-rosed can and stand the pots in the shade; here they can remain for three or four days, until the plants become established, when they may be brought out more fully into the light.

In the case of bedding-plants received at the proper time for planting into the open ground, they may be at once placed in position where they are to stand, and, after watering, be shaded by papers or other means until they can bear a full exposure to the sun.

ASPIDISTRA—DRACÆNA—TUBEROSE.

Mr. Vick:—Please answer the following questions through your Magazine, as soon as convenient:

1. May *Aspidistra variegata* be used to advantage for bedding? Could it be divided? And if so, how far apart should each small plant be set? Is it better to plunge?

2. May Dracæna, green foliage, *D. hybrida*, *D. porphyrophylla*, be used for bedding? Should they be plunged? Would they do in a place exposed the whole day to the rays of the sun?

3. To start Tuberoses in a hot-bed, is it necessary to put them in pots, or will they be injured by transplanting if planted in the soil of the hot-bed without pots? If not, I think they would get a better start by the last method. Is it not so?—S. G., *Pine Orchard, Md.*

1. Aspidistra would not prove a very satisfactory plant for bedding; if it were otherwise adapted to the purpose, its habit of slow growth would render it unsuitable.

2. Dracænas may be either planted in the open ground or plunged in their pots if desired. They will bear a full exposure well.

3. It is much better to pot Tuberoses in small pots before starting, and they can then be transplanted without injury or checking.

COTTON CLOTH FOR HOT-BED SASH.

Mr. Vick:—Will you please publish in the next number of your Magazine some method for rendering cotton cloth waterproof and transparent, so that it may be used instead of glass in hot-bed and cold-frame sashes?—R. M. T., *Sherman, Texas.*

The above is one of several inquiries received on the subject. We can answer these in no better way than to give the following from a letter from A. L. F.. Morning Sun, Iowa.:

"I copy from the Boston *Journal of Chemistry* in regard to hot-beds with cloth sashes. 'An Ohio experimenter says: Three years' experience with muslin sashes where the thermometer ranges from twenty degress below zero to seventy degrees above, satisfies me of their superiority. I make a square frame of one and one-fourth inch stuff, with a single bar of the same size down the middle, cover it with common, heavy, unbleached muslin, paint it over two coats with boiled linseed oil, and find it far better than glass. Have had no freezing or scalding, but better colored plants, more stocky, and better able to withstand early transplanting.'

"I would be glad to hear what Vick's Magazine thinks about cloth sashes. If they are as good as glass,—or even good—it would be an advantage to many of your readers to know it. If they are unsafe, your opinion may save some from disappointment."

We have known cotton cloth, prepared in the manner described, to be used for a long period

for hot-bed purposes, but have had no practical experience with it. We have frequently heard it favorably spoken of. Although a long time in use, it has not superseded glass for this special service. We should not hesitate to use it when the season is pretty well advanced, nor in localities where the climate is not very severe. It no doubt has its merits and demerits, and we would thank some of our readers having experience in its use to give us their opinions in regard to it.

CULTIVATION OF PITCHER PLANTS.

MR. VICK:—Will you please tell us, through your MAGAZINE, how to treat the Pitcher Plant. What kind of soil it requires? When to water it? &c —MRS. C. J. *Covington, Ky.*

These curious plants are frequently cultivated, and fine specimens of them are very handsome. It is necessary, in raising them, to imitate as much as possible their natural conditions. Of course, nothing could be more unfavorable to them than the dry atmosphere of a living-room. As our readers are well aware, the Pitcher Plants, *Sarracenia*, are natives of our bogs—living where their roots are surrounded with water, and in an air always moist from constant evaporation.

It has been found by experience, strange as it may seem, that it is a matter of the first importance in the cultivation of these plants to attend to drainage. Necessary as a constant supply of water is to the roots, it must not be allowed to become stagnant; consequently a

SARRACENIA PURPUREA.

fair supply of broken potsherds or other drainage material must form the basis of potting operations. Peat broken and pulled to pieces, and mixed with sphagnum chopped fine, forms a suitable soil. The plants should be placed in a good-sized, say eight-inch, pot, and the soil filled in not quite up to the crowns; over this place a layer of sphagnum, or bog moss, filling up to the rim of the pot. The pot, itself, should be placed in a pan, or box, upon a layer of sphagnum, and be surrounded with the same material to its rim. The plants like a free exposure to the light, but not the direct sunlight; a shady place in the greenhouse near the glass, or a shady corner of a frame is a suitable place; they will also do well in a north window, pro

SARRACENIA FLAVA.

vided the atmospheric conditions are suitable, and they may be successfully raised in ferneries and glass cases. An abundant and constant supply of water is, of course, a necessity. *S. purpurea* is found in peat bogs in most parts of the country, from New England to Minnesota, and *S. flava* from Virginia southward. The foliage of *S. purpurea* is usually described as pitcher-shaped, and that of *S. flava* as trumpet-shaped; the leaves of both are hollow, and hold water, with which they are usually partly filled, and this is where many a fly and other insect meets with a watery grave, for it is almost impossible for them to escape after they have once entered the tube, as the sides are clothed with hairs or bristles that point downwards and prevent the insect's ascent.

The pitchers of *S. purpurea* are from four to eight inches in length and of a reddish-purple tint, with streaks of green; the hairs in the tube of this species are stronger, and coarser, and longer than those in *S. flava*, but those of the latter are quite as effectual in holding the insects. The flowers of *S. purpurea* are of a deep purple color, and those of the other are yellow.

WATERING SEEDS.—To make small seeds grow surer, make shallow drills and sow in; cover up slightly; place laths between the rows and old newspapers over them, and some sticks on the paper to keep it in place; water on the paper and take the paper away as soon as the seeds are up.—F. H. W., *Lake Constance, Minn.*

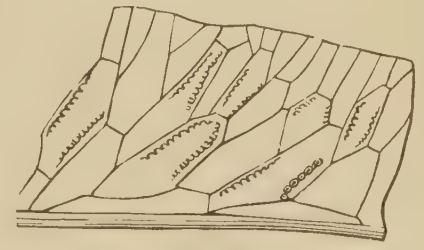
INTERESTING FERNS.

In looking over your MAGAZINE for 1879, page 253, I find, in figure 18, *Scolopendrium vulgare*, a species of Fern that resembles a small plant that I found one afternoon last September, at the mountains where I was spending a short time, and brought some half-dozen small plants home for pot culture, but not knowing the habits of flowers or Ferns at that time. Since then I have become interested in flowers and their names, &c., and desire you to examine the enclosed leaf, and inform me whether it is the same as figure 18, page 253. I gave three away and have two left, the other died; these are now in poor condition, owing to the lack of knowledge in regard to keeping them. I found the plant on a limestone rock covered with moss, and saw a great many of them in this one spot, but could find no others like them in my rambles over the mountains, but found some four or five varieties of Maiden Hair and Plume Ferns. Now, if this is the plant you speak of, I would be glad to find out, and would thank you for such opinion as you care to give.—E. B. S., *Trenton, N. J.*

The frond received with the above communication was a small one, about three inches in length, of the Walking Fern, *Camptosorus rhizophyllus*, a full illustration of which is here shown. This Fern is very peculiar in several particulars, but in none more than in the habit

CAMPTOSORUS RHIZOPHYLLUS.

of propagating itself at the extremity of the frond. From this circumstance it receives the common name, Walking Fern, as in a short time the plant moves along in different directions by its offshoots; the specific name, rhizophyllus, root-leaf or rooting-leaf, is in allusion to the same habit. The fronds are from three or four to twelve or fifteen inches in length, and from half an inch to one inch in width at the widest part. The frond is drawn out into a long, slender prolongation that bends downward, and at length touches the ground where, in a short time, it roots and a new frond arises, thus forming an independent plant as soon as the tip of the old frond decays and becomes detached. The large fronds have the lobes or auricles at the base considerably developed, so as to make the base heart-shaped, or, where they are extended laterally, hastate or halberd shaped. The fruit dots, which are in lines, are somewhat irregularly disposed in relation to each other, but, in reality, are arranged in a perfectly orderly manner, when considered in reference to the venation. To make this perfectly clear, an enlarged part of a frond is



CAMPTOSORUS—SECTION OF FROND.

shown with the peculiar veining. Here we perceive that the veins form a net-work with each other, so as to produce irregular, hexagonal or six-sided meshes; next to the rachis or mid-rib they are only half of a hexagon, the meshes of the next row are six-sided, and so are those of the next row, and then the veinlets run, either directly or after once branching, to the margin of the frond. Now, the fruit-dots are on the veins on opposite sides of the meshes, with their indusia or coverings attached to the veins, with the other margin free; thus the coverings open facing each other, which is precisely the arrangement of Scolopendrium, the distinctive difference being the venation, which in Scolopendrium is parallel. Sir W. J. HOOKER considered the Camptosorus as a species of

LYGODIUM PALMATUM—PAIR OF FRONDLETS.

Scolopendrium. In reference to this matter, Professor EATON, in his *Ferns of North America*, considers it probable that future botanists will refer both Scolopendrium and Camptosorus to the old Linnæan genus, Asplenium.

The next mail after the one in which was re-

ceived the Walking Fern, brought another, the Climbing Fern, from the north, accompanied by the following note:

I want to know what the name is of the plant which I enclose, and which I have cut into pieces to admit of transport. It is evidently a very pretty climber, and is used by the ladies for decorating lace curtains.—R. O'H. *Chatham, Ont.*

Lygodium palmatum comes this time from Canada, not because it is a native there, but because it is so much admired that the ladies have secured it from dealers to grace their rooms. It is found in few localities—principally in Connecticut, in Greene county in this State, and in a few places in Pennsylvania. This Fern climbs and twines upon the grass and other

LYGODIUM PALMATUM.

vegetation near it, and in this respect is very different in habit from any of our other native Ferns. The engravings, showing the whole frond in miniature, and a pair of leaflets or divisions of natural size, give a fair idea of its appearance. The divisions of the upper part of the frond are fertile, and these contract so as to become very small. Quite a large trade, in Connecticut, is now connected with the cutting and preparation for market of this Fern, for sale principally during the holidays. They have become so generally known and are so much prized as to be in demand in all parts of the country; they are commonly known to the trade as Hartford Ferns. Many attempts have been made to subject *Lygodium palmatum* to pot culture, but with poor success. *L. scandens*, a species from Japan, is very tractable under this treatment, and forms a beautiful object when well grown.

A TROUBLESOME INSECT.

James Vick:—Can you inform me what will kill insects on window plants. I have quite a large collection of plants, and they are nearly black with little bits of black flies, which either lay an egg in the earth that hatches out a little maggot, or else they turn into a maggot themselves I have taken up some of the smaller plants and baked the earth, but that does not do the work thoroughly. If you will tell me what will kill the fly and the maggot you will confer a great favor.—Mrs. C. F. C., *Rock, Mass.*

Mr. Vick:—I have a few choice plants which I am very desirous to preserve through the coming winter, but I am somewhat troubled with a very small fly, resembling a gnat; the flies hatch in the dirt; they seem to sting the leaves, and that causes them to look dry and scorched. I have been told to shower with ice-water and tobacco-water. I have tried both with very little success. They are not quite as bad for a day or two, and then they are as bad as ever. Will you be kind enough to reply and tell me how to destroy them. —Mrs. H. H. B., *Little Sioux, Iowa.*

These letters represent many that we are constantly receiving from all parts of the country; now, as we write, another is handed in; this one from Minnesota, and the writer says "there are a great many small, black flies about my plants this winter, and very small, white worms in the soil, not so large as the head of a pin; they appear only when I water the plants. Please tell me the cause and remedy."

If these insects prove troublesome they can be kept under by frequent spraying the foliage of the plants with water by means of a sprinkler or vaporizer. The small worms, or grubs, can be destroyed by saturating the soil with lime-water. A pound of quick-lime is sufficient for four gallons of water. Place the piece of lime in the water and let it slake, and afterwards to settle; then pour off the clear liquid—this is lime-water. The pots with soil having worms in can be placed in the lime-water and allowed to stand for ten or fifteen minutes, or until the soil is saturated, and then be taken out and allowed to drain. The worms will be destroyed, the plants uninjured.

MULLEIN FOR SMOKING PLANTS.

For two years I have smoked my house-plants—among them are Verbenas and Calceolarias—two or three times a week with Mullein, and have had no trouble with insects of any kind, except, sometimes, worms in the pots. I conclude this, at least, must be a preventive, and may prove a good substitute for tobacco smoke.—C. J. C.

Although tobacco fumigation is quick and efficient in the destruction of plant aphides and thrip, and for general use is likely to be employed for a long time to come, still, for house-plants and in conservatories attached to the house, something that would destroy the insects as surely, and yet not leave the disagreeable smell that tobacco does, is very desirable.

THE LYCHNIS.

Will Mr. VICK please tell us people in Vermont the name of a plant that grows here? It is a perennial. It used to be thought perfectly hardy, but of late years it does not bear the winters well, so most of it is lost from our gardens and none know its botanical name, but all are very sorry to lose so beautiful a plant. Here the

plant is called Ragged Robin; it has magenta-colored flowers, and blossoms in June, and continues a long time in bloom. Please tell us its name.—MRS. L. N. J., *West Calais, Vt.*

A species of Lychnis, *L. flos-cuculi*, has long been cultivated in this country under the name of Ragged Robbin, and is the plant described above. Lately, less attention has been given to it on account of the superiority of many other plants, and of other species and varieties of the Lychnis.

Instead of a single color of these plants, one may have scarlet, white, vermillion, rose and other shades, and some kinds, also, have much larger flowers; *Lychnis Haagena hybrida* has flowers about two inches in diameter; the illustration of the single flower here shown is about half the natural size. The accompanying engravings of flower-cluster and plant represent the mode of growth.

EPIPHYLLUM.

MR. VICK:—As you give information to all amateurs in flower-growing, I take this opportunity to ask you about the Epiphyllum. When is its growing season, and its resting time? I have trouble with the leaves falling off in the months of September and October, so that the plants look bad and don't flower well. I hope you will soon give some information on the subject.—F. E. T., *Lyon Farms, N. Y.*

The Epiphyllum will thrive in good, fibrous loam and sand, well drained. During the growing season it requires to be near the glass, and have the benefit of all the sunshine, and plenty of water. By the middle of August the supply of water should be checked and only enough allowed to keep the plant from wilting or shrivelling; plenty of air should now be given, and at this time, too, the heat should commence gradually to decrease until a temperature of 50° or 45° is reached, at which the plant may be kept while resting. What is desirable in the autumn months, is to ripen and harden the new growth, for upon this depends, to a certain extent, the ability of the plant to produce its flowers.

In January or February the plant may be started into growth in a temperature of about 60°. At this season only a moderate supply of water is necessary. The buds should soon appear, and when the flowers have expanded the plant should be placed where the temperature will be lower.

HEPATICAS.

MR. VICK:—This is apropos of Miss A. B. S.'s communication in regard to Hepaticas in your February number. So far from acutiloba being a "sport," GRAY calls it a species. It is the only one found in the west. In acutiloba the pink flowers are the largest and most numerous. There is never but one flower on a stem. I think it probable that Miss S. has never seen acutiloba. In northern Illinois and Iowa it blossoms during the first two weeks in April.—MRS. W. J. S., *Dubuque, Iowa.*

This statement is correct as to the position GRAY assigns this plant; but it should be noticed that GRAY appends to his description of it the remark, "perhaps runs into the other," refering to *H. triloba* previously described; thus showing a doubt with which it was assigned its rank as a species. One having had the privilege of seeing the six or eight species that some botanists define, and observing the slight variations upon which they are based, would be apt to hold very firmly a doubt of more than one species, and to consider all the different forms as variations of *H. triloba*.

TRAILING ARBUTUS.

MR. VICK:—I saw an article in a newspaper saying VICK had said he saw no reason why Trailing Arbutus could not be made to flower in the house. Will you tell me what you think about its being possible, in your next MAGAZINE, and also if you think they would bear transplanting to the garden? I do not think it grows in this vicinity.—MRS. H., *Albany. N. Y.*

We have no knowledge of having made the statement that appears to have been attributed to us. On the contrary, have stated otherwise, and have discouraged attempts by amateurs to cultivate the Epigæa in pots for the house or window-garden.

The plants, if very carefully removed early in the spring from the places where they are growing in a wild state, may be bedded in a Wardian case, or small fernery, or jardiniere, and will produce their flowers, but soon thereafter, they will begin to fail, and have only a short and feeble existence. If the plants could be removed, without disturbing their roots much, to a shady place in the shrubbery, and allowed to remain there, and receive no mutilation by spade or fork, probably they would reward one with their company for a time.

PANSIES.

Fairest of the humble flowers,
Waked to bloom by early showers,
What a wealth of meaning lies
Hidden in your pensive eyes!

Wait your petals slow unfolding,
Patient of the dark earth's moulding,
Till you open to the morn
With a grace of Eden born.

With no weary, painful weaving,
Nor with restless unbelieving,
In such vesture you are clad,
As no monarch ever had.

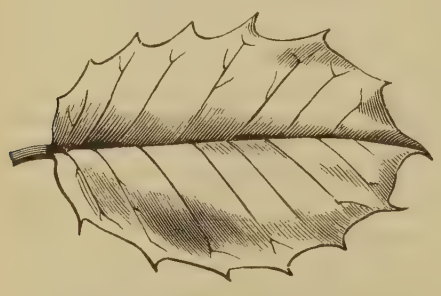
While in storm or sunshine growing,
With such matchless beauty glowing,
To my list'ning soul you speak
Of the perfect world I seek.

Crowned with gold and purple splendor,
Yet so lowly, meek and tender;
Types you are of patient souls,
That have won its peaceful goals.

—C. J. C.

THE AMERICAN HOLLY.

MR. VICK:—I am sorry to see that you are not better posted in regard to our American trees, as you say in your last MAGAZINE that the Mahonia is the American Holly. If you will visit this part of the country you will find the Holly grows so plentifully in some places that the owners of the land consider it a nuisance. It grows, in many places, eight or ten feet in height, bearing red berries, and the leaves continue of a bright green throughout the coldest winter. While the Mahonia, though slightly resembling the Holly in summer, seldom exceeds one foot in height, bears blue berries, turns brown on the slightest approach of frost, and loses its leaves entirely before the new ones appear. I do not know of any one who has ever seen the Mahonia growing, like the Holly, on wild land. One of my neighbors obtained his among some other plants from France. I have reason to know something about this subject, as I was once promised, by the agent of a nurseryman, a Holly tree four feet in height and bearing berries; but as the man failed to bring it, I sent for it by a friend, who paid one dollar for the best tree the man could furnish. This proved to be a Mahonia, and is not quite so tall now as it was at first, being now less than one foot in height, and could be bought from an honest nurseryman for ten cents or less.—J. A. B., *Ponkapog, Mass.*



ILEX OPACA—NEARLY NATURAL SIZE.

Our correspondent is in the main correct in the remarks above, but apparently he is not aware that the Mahonia, or *Berberis aquifolium*, as it is now considered a Berberis, has long been known in the trade in this country as American Holly; this, however, is so, and though the Mahonia is comparatively but little cultivated, yet, take the country over in its length and breadth, and we have no hesitation in saying that it is far more widely known as American Holly than *Ilex opaca*, to which our correspondent refers. This is confined to its native localities along the eastern sea coast, but that has been disseminated in every section of our land, and over the greater part of Europe. To be sure, it is not a Holly, but that does not prevent its being called so, any more than it does the *Helleborus niger* from being called Christmas Rose, or Abutilon, Flowering Maple. The fact is, that the Mahonia will thrive over a wide extent of our country and is becoming fairly well known; to those acquainted with the Holly from seeing it in the old country, or otherwise, it is at once suggested at the sight of the Mahonia; hence its popular name. The Mahonia is a native of Oregon; it grows from six to eight feet high and forms a large, spreading bush; many specimens can be seen in this city from four to six feet high and from five to eight feet in diameter. The foliage often remains green and fresh through the winter—it is always green when protected by snow or sheltered by other shrubs, but is frequently browned by the frost when fully exposed.

BERBERIS AQUIFOLIUM—¼ NATURAL SIZE.

We know that *Ilex opaca* is known as American Holly at Boston and in other localities in New England and along the Atlantic coast, but its range is comparatively narrow; it does not appear to be adapted to general cultivation.

The Mahonia, on account of its pinnate

leaves, resembling, to some extent, those of the Ash, bears also the common name of Ashberry. The illustrations given will convey more fully than a word-description the appearance of the foliage of these two plants.

PEANUTS.

Please give me some information about raising Peanuts, telling how to plant and to care for them.—W. H. H. D., *Milo, Kansas.*

Peanuts are considered to be about as easy to raise as Corn. The plant has a long tap-root, like Clover, that descends a long way into the ground. A sandy soil is best adapted to this plant, but it should be in good condition and dug deep. The planting should be made as soon as the frosts are past in the spring. When only a few are raised in the garden, it is customary to shell the seeds, but in field culture they are planted in the pod; they are put in the ground about three feet apart, and four seeds in

a place, and covered about two or three inches deep. When the plants are up, they can be thinned out to two in a hill. They require frequent hoeing to keep the ground clean and mellow. In field culture the rows are placed about three and a half feet apart, and the pods dropped two in a place, the hills two feet asunder. Here the cultivator is used instead of the hoe.

The blossoms are produced on branches near the ground, and, as soon as the pod forms, the flower stem turns downward to the earth, and the pods, as they grow, bury themselves in the soil; in this they may be assisted by drawing up some soil lightly about them with the hoe, just after the flowering season. The pods require the whole season to perfect themselves, and harvesting is, consequently, postponed until the first frost destroys the vines. It is probable that in some parts of Kansas the Peanut could be made a profitable crop.

SUMMER TREATMENT OF CALLAS.

Our readers, in the care of their Callas, may with confidence adopt the practice so well described below by *Ficus Elastica*, and they will be rewarded with as fine plants as they can wish:

"Almost the first question one asks a florist is, How do you care for your Callas in summer? The answer is, plant them out in the garden and cultivate the same as Potatoes, being sure to put them in a sunny situation and keep free from weeds. In the fall, about September 15, take up and pot them in a good, rich soil, containing one-fifth sand. Care should be taken not to have too large a pot—one you can conveniently put the roots in, and no larger. Many persons will place their Calla in a common wooden pail, and then wonder why it don't bloom. It must get pot-bound and remain so if you wish it to bloom. Plenty of sand in the earth is for drainage, as the plant needs a great deal of water, and it must pass through the earth; if it should remain in the pot the soil would sour and the plant stop growing, and perhaps die. After taking out of the ground and potting, place in some shady position for eight or ten days and water sparingly. About the 10th or 15th of November begin watering with warm water; commence with water milk-warm, and increase the heat gradually each day until the water is hot, but not scalding. Pour the hot water upon the earth, and not on the stalks of the plant. Don't be sparing of water at any time, except for a few days after potting. This will make it bloom about the holidays. A south exposure is best, as it delights in the warm sunshine, it being a native of Africa, along the River Nile. Toward spring its leaves will begin to turn yellow; then, as soon as it is warm enough, plant out in the garden. In potting do not let the earth come to the top of the pot by an inch. As often as convenient during the winter, sprinkle the leaves with warm water, to prevent red-spider and wash off the dust. We saw a Calla treated as above, last winter, that had seven blossoms on at one time, and twenty during the winter."

COLD WEATHER IN EUROPE.

The month of December was a very severe one both in England and France, and we hear of much damage that has been done to the vegetation of those countries. In the *Jardin des plantes*, Paris, rare trees that had withstood the most severe weather for a century had split from top to bottom, by the action of the frost. a great destruction of plants and trees is reported in many of the French nurseries.

AMERICAN ROSES.

A paper was read before the Western New York Horticultural Society, at its last session, by H. B. ELLWANGER, on American Roses, giving a list of Roses that have originated in this country, with a short description and statement of the origin of each one, when known. The following is the list presented as of undoubted American origin:

PRAIRIE ROSES — *Rosa Rubifolia* — Anna Maria, Anna Eliza, Baltimore Belle, Eva Corinne, Gem of the Prairies, Jane, King of the Prairies, Gracilis, Linnaean Hill Beauty, Madame Caradori Allan, Milledgeville, Miss Gunnell, Mrs. Hovey, Mrs. Pierce, Pallida, Perpetual Pink, Pride of Washington, Queen of the Prairies, Ranunculiflora, Superba, Triumphant.

NOISETTE ROSES, OR CHAMPNEY ROSES—America, Beauty of Greenmount, Champney's Pink Cluster, Cinderella, Dr. Kane, Isabella Gray, Nasalina, Tuseneltea, Woodland Marguerite.

BOURBON ROSES—*Rosa Bourboniana*—Chas. Getz, George Peabody, Oplitz, Renno, Setina.

BENGAL ROSE—*Rosa Indica*—James Sprunt.

HYBRID PERPETUAL ROSES—*Rosa Damascena hybrida*—Belle Americane, Mme. Boll, Mme. Trudeau, Charles Cook, Contina, Il Defense, La Brilliante, Rosalina, Souvenir de President Lincoln.

TEA ROSES—*Rosa Indica odorata*—American Banner, Caroline Cook, Cornelia Cook, Desantres, Gen. Washington, Isabella Sprunt, Paradine, President.

Mr. E. says, "There is no reason why we should not succeed in obtaining a new class of hardy climbers, which shall, in a great measure, combine the good qualities of the Hybrid Perpetual, Noisette, and Prairie Roses. By patient study and care, this may be done; who is there that will do it? To accomplish this desired result, the Prairie varieties might be made the seed parents, and fertilized by different varieties of Remontant and Noisette Roses known to be good seed bearers, and that are otherwise desirable sorts.

"In the production of new Roses, instead of having exhausted the field, as a few writers have incautiously observed, we have only just entered it; the future possibilities open to the raiser of new Roses, is only dawning upon us. Lyons, France, is the head center from whence most of our cherished Roses have come. Mons. Jean Sisley, an eminent horticural authority, says that none of their Rosarians practice artificial fertilization, they simply gather and sow the seed, as they would sow a field with Carrots, and for the most part not even keeping the varieties separate. Nature, unaided, is left to do all, and everything is left to chance. By adopting the same practice we might just as well produce many varieties of value, and I hope there will be found among us many to thus take their chance in the production of new sorts. But why leave it all to chance? What more pleasing occupation can there be than, by hybridizing artificially, to engage in the art of producing new varieties, aye, and not only new varieties, but new types of Roses now unknown."

INTELLIGENT CARE OF PLANTS.

A lady in a remote part of Texas, "the outskirts of civilization," as she says, writes us of her efforts at gardening and floriculture: "I should like to tell your readers of a hanging basket of mine, a small, wooden tub, filled with Wandering Jew, and hung with wire. I had it in a south window. Every one who saw it was astonished at its luxuriance. The prettiest I ever had for a hanging basket, though, was the Countess of Ellesmere Petunia." In raising plants of any kind, quite as much depends upon the skill and attention of the cultivator as upon the variety of the plants. What, in the hands of one, might turn out not much better than a miserable, ill-formed weed, with another is raised up into a form of beauty and grace. A wooden tub entirely concealed by luxuriant foliage is really as good, in that condition, as the most elegantly formed vase; but how many would so effectually care for plants as to make so much out of them. If we lend a loving, helping hand they will show us how beautiful they will become, expressing their gratitude in flowers and fragrance.

THE CELERY-CURE.

Most of our readers have no doubt heard of the reputed curative effects of Celery for nervousness and for rheumatism. A writer in an English journal, *Gardening Illustrated*, relates his experience in the use of it for rheumatism, and gives the result. The faithfulness with which the remedy was tried in this case adds very much to its value; in fact, there is no doubt but it should be placed on the scientific record as an *experimentum crucis*: "Seeing that Celery boiled was a cure for rheumatics, I was induced to try it. I had rheumatism in the muscles of my right arm. I had one head of Celery boiled every night for three months, and two or three glasses of whisky and water every night, which I was told was good remedy. The result has been that the rheumatism is worse now than when I first used Celery; therefore, from my experience, I do not believe that boiled Celery will cure rheumatics."

ANOTHER CABBAGE WORM.

A new Cabbage worm, the larva of *Pionea rimosalis*, was noticed last year in Illinois, at Carbondale. In the language of Prof. Cyrus Thomas, who describes it in the *American Entomologist*, "The larva, when full grown, is six or seven-tenths of an inch long (a 16-legged Pyralid larva); slender, slightly flattened; head shining greenish-yellow; dorsal portion of the body down to the breathing pores, purplish-brown; this portion marked with numerous transverse whitish lines, two or three to a segment; a narrow, pale-yellow line along the region of the stigmata; under side pale green. In the breeding cages they went down to the soil, but not into it, to pupate; forming a slight, regularly-shaped, oval cocoon, thickly covered over with sand.

"These worms eat, as a general thing, elongate oval holes in the leaves, gradually extending them until nothing but the larger veins remain. They also bore directly into the heads, to the depth of, or rather through three or four leaves; a habit, so far as my experience goes, wrongly ascribed to the larva of *Pieris rapæ*, which will seldom eat through even one leaf of a solid head until it is at least slightly loosened."

There are thought to be three broods of worms in the season, in September, October, and November.

Fresh lye appeared to be the best article that was used for their destruction; and the best preventive to their injury is to get the crop in earlier and cultivate better than usual, so as to make it as advanced as possible when the full brood appears.

W. N. Y. HORTICULTURAL SOCIETY.

Our readers interested in fruit-culture may, perhaps, be pleased to learn that a report of the last annual meeting of the Western New York Horticultural Society has just been issued in pamphlet form, and can be obtained from the Secretary, Mr. P. C. REYNOLDS, of this city, as will be noticed in our advertising columns. This society ranks among the first of the kind in the country, and is always up to the times. Those desiring reliable information upon horticultural subjects will find much that is valuable in these pages.

FRUIT PROSPECTS AT THE SOUTH.

Reports have been received from Tennessee, stating that, on account of the unusually mild weather in January, the prospect for Peaches and Strawberries is very poor. In the latter part of January they were in full bloom, and the probability is that, by the cold weather since, the young fruit has been destroyed.

ABUTILON AND SCALE INSECT.

Noticing in your MAGAZINE for April, 1879, the inquiry of "G. W. H." with regard to the care of the Abutilon, allow me to state my experience with one infested with the scale insect. I had tried strong soap-suds, but unsuccessfully, perhaps for lack of thoroughness. I then tried the experiment of driving tacks into it (the plant was too small for nails.) This was done last spring, and no scales have appeared upon it since. Three years ago I tried the same remedy upon an Oleander which was large enough to allow shingle nails; since then I have had no trouble from the scale. I was led to try this experiment by having seen in some horticultural publication that a diseased fruit tree had been restored to a healthy condition by the nailing upon it of some arrangement for a clothes line. The success of the experiment has been so signal with me that I would like to have others know of it. Perhaps bits of iron in the soil might answer as well, but of that I am not sure.—MRS. C. B., *Hanover, N. H.*

CLIMATE OF OREGON.

MR. VICK:—I am an enthusiast in regard to the climate of my adopted State, and have boasted not a little that we could trust Dahlia and Gladiolus bulbs to the winters with perfect safety, but never knew before that Petunias were perennial anywhere. They bloomed with us until Christmas, and then were cut down by the frost, and I supposed were killed, but I see they are sprouting again near the ground. Snapdragons bloom all winter, and even Geraniums, Fuchsias, and Oleanders winter over safely without the least protection, if planted in a pretty dry spot in the garden, though they may be frozen down to the ground and have to start again from the root. Let any State in latitude 42° beat that, if it can, even where the ground is covered with snow.—R. K., *Jacksonville, Oregon.*

A GOOD CALLA.

We have a Calla Lily which we bought four years ago last fall. It has blossomed every winter except the first, and now has seven perfect buds on it—two just opened, and five more quite white, and to-day we think there is an eighth bud coming. The leaves number about thirty and are very large. It is in an old 100-pound paint keg, and has filled it until the roots are like a cheese. We intend to give it more room when we repot it next fall after its summer's rest. We feel amply repaid for all the expense and trouble. "A thing of beauty is a joy forever."—A. D. W., *Stanley, N. Y.*

PUBLICATIONS RECEIVED.

The Desired Haven, At the Beautiful Gate, The Palace of the King, three beautiful little books of religious poems, compiled by the author of *The Changed Cross*, and published by ANSON D. F. RANDOLPH & Co., of New York, we can recommend to all lovers of sacred poetry.

Notes on Lilies and their Culture. Second Edition. By Dr. WALLACE, Colchester, England.

This monograph of Dr. WALLACE is very comprehensive, and profusely illustrated, and indicates a love for the plants of this genus, and energy and perseverance in observing, collecting and recording facts relating to them, such as is seldom seen even among enthusiasts. We shall take occasion hereafter to refer more particularly to this valuable work.

Botanical Hand-Book. By C. E. HOBBS, Somerville, Mass. Pp. 270; price $2.00.

The above is the name of an extensive list of common local, English, botanical, and pharmacopæial names, arranged in alphabetical order, and of most of the crude vegetable drugs in common use, together with their properties and uses. The book is especially designed for reference by druggists, but we find it very serviceable for our own use, and by its aid we are enabled to discover what plants some of our correspondents mean when they refer to them by local names, familiar enough to themselves, but of which we know nothing. As a single illustration, there are fifty-five kinds of Rose mentioned as common names; twenty-five of these are names of the Rose, the other thirty are not names of the Rose in the true sense, but are commonly used for such plants as Poppy, Rhododendron, Oleander, Kalmia, Convolvulus, &c.

ODD, INTERESTING, AND HANDSOME.

MR. VICK:—I noticed on page 47 of the February number of your MAGAZINE that "T. F." speaks of a curious freak of nature in a yellow Dahlia, at the manse garden, and thinking it would interest you, will tell you about mine. On the 1st of October I noticed twin buds on my Dahlia, James Wilder, growing back to back and close together. I watched them closely and they both bloomed at the same time, and, when full grown, formed a perfect globe, and very large. We were very sorry to have it fade, it was so handsome as well as curious, and was much admired by all who saw it. I wish you could have seen my Japan Cockscombs from seed received two years ago. I set out twenty plants in a bed, and by the 1st of August they were the most beautiful plants for miles, and continued so until frost. My Egg-plants were also very fine and large, many of the Eggs weighing from four to five pounds each; the variety was the Improved New York. —MRS. W. A. R., *Vincennes, Ind.*

ROCHESTER SCIENTIFIC SOCIETY.

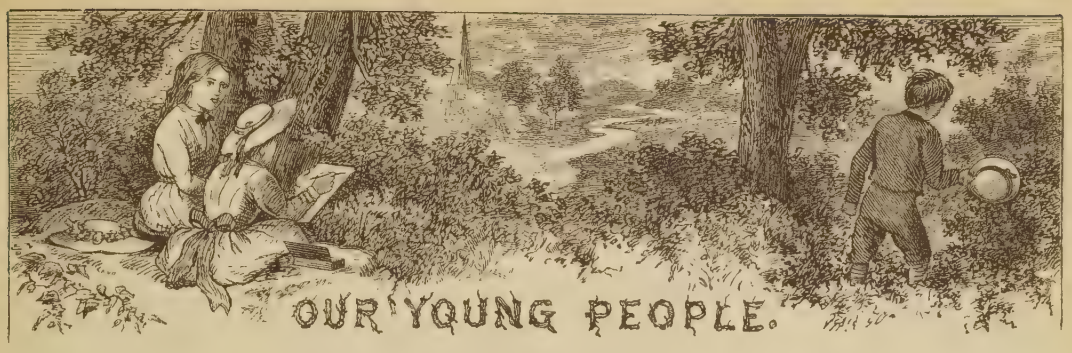
Quite a number of very accomplished ladies of this city have had occasional meetings during the past year, to study and read papers upon scientific subjects. It is with pleasure that we now are able to record that these gatherings have resulted in the organization of a society where any one sufficiently interested may engage in the pursuit of any of the natural sciences, and receive such aid from other members, and by reference to valuable books, and the use of expensive instruments, that will enable them to advance far more rapidly than would be possible by their unaided, individual efforts. Although the management of the society is in the hands of the ladies, we understand they do not intend to debar the other sex from its privileges. The society has the full encouragement of the most intelligent members of the community, and it will, without doubt, exert a great influence in raising the standard of the intellectual attainments of the ladies of this section of the country. It is very gratifying to notice the desire for self-improvement and mental culture that exhibits itself among ladies in many ways.

WINTER TOMATOES.

A note is made by the *Gardener's Monthly* that "the forcing houses at Senator Cameron's, at Lochiel, near Harrisburg, have their usual winter's attractions in Cucumbers, Tomatoes, &c. On the 8th of January, a visitor informs us, at least a bushel of ripe Tomatoes could be had at one picking, not one of the fruit being less than ten inches around. The flavor of these forced Tomatoes is singularly delicate, and the flesh mealy. It is amazing that more of our wealthy people do not have these luxuries. Of course it takes skilled gardeners, like Mr. JOHN PAGET, to do the thing cheaply and well; but such good gardeners are generally to be had if the proper steps are taken towards finding them."

BLUE FLOWERS.

I notice G. W. T.'s remarks on blue flowers, in the January number of the MAGAZINE, page 14. I do not know of a better bright-blue flowering plant than *Plumbago larpentæ*. It blooms abundantly, and is very showy from August to November, and is hardy here, with a slight protection of evergreen branches during the winter.—C. E. P., *Queens, L. I.*



CHERRY BIRDS.

The Cherry bird is a name frequently given to our Cedar bird, *Ampelis cedrorum*, but there is no reason why the Robin may not be equally entitled to the same honor; indeed, the latter bird, being far the most abundant, and quite a gormand, is really more destructive than the Cedar bird in this respect, not only to the Cherries, but to other fruits that may suit his fancy.

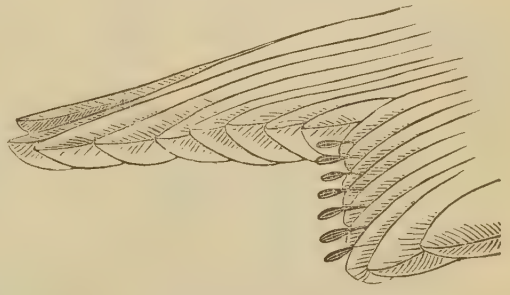
In the orchard we had but one good Cherry tree. It set quite full of fruit, and as the fruit began to show signs of ripening I grew very anxious. While surveying the tree one morning, I plucked a half-ripe Cherry and ate it by way of trial. The Robins near by scolded me a good deal for taking such a liberty. It was all the fruit I got, however, for when the

HEAD OF CEDAR BIRD.

Cherries ought to have been ripe, there was not a single one left to ripen! Had the Cedar birds taken them? No, indeed, it was the dozen saucy Robins that lodged in my Apple trees, that had so effectually demolished the Cherry stock.

There was one pair of Cedar birds nesting in an Apple tree near by, but they came late, as is usual with them, and while rearing their young, like other birds, they fed almost exclusively on insects; when their brood was raised they took their departure, and I do not remember seeing them once at the Cherries. Still, it is a well attested fact that Cedar birds do occasionally eat Cherries; but so does the Cat bird, the Oriole, and perhaps other birds might be mentioned that find a good, ripe Cherry, now and then, quite an addition to their bill of fare.

The Cherry bird, so called, is a quiet little fellow, of a sleek, sober-brown color, some lighter underneath; chin blackish, a fine crest which can be raised at pleasure, and several little scarlet appendages to some of the wing and tail feathers, like little bits of wax, that have obtained for it the name of Wax-wing. These birds seem to be totally devoid of song, having but a faint twitter or lisp. In the winter time they subsist chiefly on the berries that remain on some of our native trees and shrubs, but when spring sets in and insect life begins to stir, they do their share in devouring the obnoxious little pests, and, for this reason, ought



WING OF CEDAR BIRD.

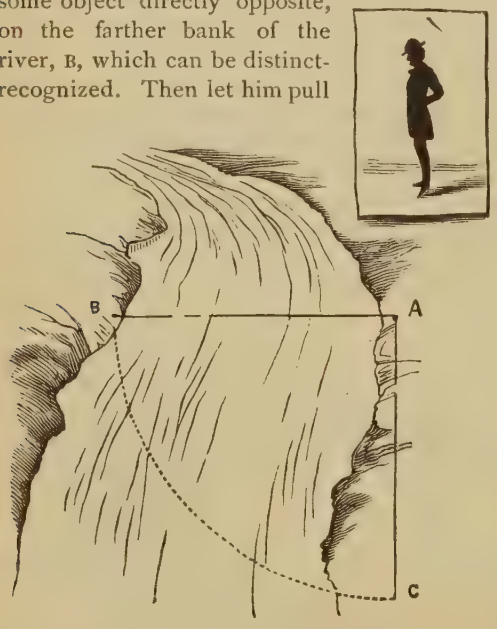
to be encouraged. One of old said, "he that does not work, neither should he eat." Now, the Cherry bird, the Robin, and most of our feathered tribe, work for us most industriously, and are, therefore, worthy the subsistance they can find in our orchard or dooryard. We are glad our laws recognize these facts and are so strict in the protection of bird life, making it a serious matter to meddle with the birds, their nests, or even to have their eggs in possession. And yet, with all these precautions, it is sad enough to meet occasionally a lady with one of these birds stuck on her bonnet by way of ornament, and I am credibly informed that thou-

sands of the smaller birds are annually slaughtered for no other purpose than to decorate the head dress of the gentle sex. Such adornment renders the wearer a conspicuous object for the commiseration of all thoughtful and compassionate people.—ARTIST.

THE WIDTH OF RIVERS.

MR. VICK:—Your MAGAZINE is a welcome visitor at our house. While perusing the January number of this year I noticed your correspondent, "J. W.," gives some good and correct rules for ascertaining the height of trees, and mountains, and the width of rivers. There is another way, much easier and more simple, of finding out the width of a river or the distance between two given points or objects. It is rather a novel one, but may interest some of your young readers. It is as follows:

Let the student select a tolerably level piece of ground for his experiments on the bank of a river, mark the place where he stands, A, also some object directly opposite, on the farther bank of the river, B, which can be distinctly recognized. Then let him pull



down the peak of his cap, or the brim of his hat, until the outer edge is in direct line between his eye and the selected object on the opposite bank; then turn half around, keeping the head in the same position, (be very particular on this point) and look along the edge of the river until the eye strikes the ground, C. This spot he must mark distinctly, and measure the distance from where he stands to this point, and, if he has been particular in his work, this will give him the width of the river, near enough for all practical purposes. A few trials will perfect the operator in this simple, yet useful, operation. By experimenting on the land between any two objects he will soon be proficient, and master of the situation. This plan has the merit of being free from geometrical complications, and so simple that any person can do it, if they do not know B from a bull-frog.—J. S., *Peterboro, Ont.*

BOTANY FOR LITTLE FOLKS.

Here are some Potato blossoms. We have seen them so often, it is not difficult to recognize them in the engraving. And yet, what can we tell about a Potato blossom? Let us examine it more closely. The calyx is mono-

Fig. 1. Potato Blossoms, Solanum tuberosum.

sepalous and has five points, as shown in figure 2. After the flower withers, the calyx still remains, even until the fruit is ripe; on this account it is said to be persistent. The corolla, which is situated upon the receptacle, consists of a very short tube and a flat, spreading limb with five points; a corolla of this style is called wheel-shaped, or rotate. The stamens, five in number, are placed upon the corolla, as may be seen in figure 3, which is a representation of a vertical section of the flower; they have short filaments, but comparatively long anthers, with two chinks, or pores, at the top of each one by

Fig. 4. Diagram.

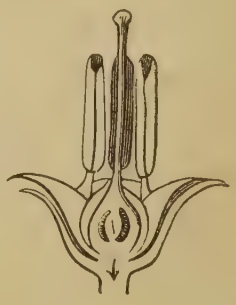


Fig. 3. Potato flower—vertical section.

which the pollen escapes. The anthers stand upright by the side of each other, appearing to

form a tube, through which protrudes the style. The diagram, figure 4, besides showing the relation of the different parts of the flower in the bud, also gives an idea of the manner in which the corolla is folded together. A careful study of the Potato blossom will fix in the mind the characteristic appearance of the flowers of the family of plants to which the Potato belongs. The name of this natural order is the Nightshade family, or Solanaceæ. We do not mean to be understood that all the flowers in this family are alike, for they are not—they differ considerably. It would be well to examine at the same time, if possible, a flower of Tobacco, and a Petunia, and a Datura, for they are all members of this family.

The foliage of the Potato, in one respect, is not well represented in our illustration; in fact, it would be difficult to do so without giving quite a number of drawings, for the leaves are quite variable; they may be divided, as here shown, or quite irregular, as is often the case. One part of the leaf appears to grow out of another part, and this process may, perhaps, be better defined by the term, budding, than by any other.

Fig. 2. Calyx and Pistil.

The specific name of the Potato, *tuberosum*, refers to the tubers which the plant forms at its base in the ground. The plant sends out branching stems underground, which, in one place and another, swell out into solid bodies, more or less rounded, oval, or oblong in form; these enlargements, or solid bodies, that we call Potatoes, are really enlarged branches, bearing buds, commonly called eyes, and that will start and grow, under favorable

Fig. 5. Potato tubers.

conditions. This enlargement of the underground stem consists of an accumulation of starch. The Potato is one of the best examples of a tuber. There are said to be several natural species of Potatoes that form tubers, but, possibly, they are only variations of one sort.

Solanum tuberosum is found growing wild in Peru and Chili, and in some other parts of South America. The Potato was carried to England from this country by the expedition of Sir. WALTER RALEIGH, and it is thought to have been introduced a short time previously into Virginia by some Spanish immigrants, for it was known to the Spanish, and had been carried by them from Quito to Spain some time

Fig. 6. GROUP OF TOMATO FRUIT.

before. The Potato was used very little, as an article of human food, for a long time after it was known by Europeans, and it is only within the last century that it has risen to the place it now occupies for this purpose.

As we all know very well, the common way of propagating the Potato is by pieces of the

Fig. 7. Egg-Plant.

tuber, really, as we have seen, cuttings of an underground stem; it may also be raised from cuttings of the green, growing shoots and stems, and this method is practiced by gardeners who wish to obtain quickly a stock of some valuable variety.

For a long time after this vegetable became commonly cultivated, it was quite free from disease of any kind, and the tubers that were dug in the fall and stowed away in pits, or in cellars, would be sound and fresh the next spring, and even keep well into the summer. About fifty years ago it was noticed that there was a tendency of the Potatoes to decay early, and, for a time, this was accounted for by unfavorable weather, either while the crop was growing, or when harvested; but it was soon found that the disease became worse every year, although, to be sure, it was not so bad when the season was a dry one, and the crop was gathered without being exposed to rains; still it progressed. Finally the idea began to establish itself in the minds of thoughtful men, that the disease, whatever was its cause, prevailed because the plant, by continued propagation by cuttings, had become weakened, and was, therefore, unable to resist some unfavorable conditions to which it was exposed. A loss of vigor, when long propagated by cuttings, had been noticed in many other plants, and it was eventually proven that this was the effect that had been produced in the case of the Potato. With this view of the matter, experiments were undertaken to raise new varieties from seed, hoping they might prove hardier. The result was entirely satisfactory, and, besides, it was found that the character of the tubers could be modified in different ways so as to very much improve them. We have now varieties that perfect their tubers very much earlier than formerly, and those that yield better crops, that are smoother on the surface, or have the eye less sunken, and those that are otherwise improved. The method of cross-fertilizing, that consists of conveying the pollen of one variety to the stigma of another, is now so well understood that we can expect with much confidence still greater improvements in the Potato in future.

Fig. 8. Nierembergia.

Another plant belonging to this family, and furnishing us food, and that is scarcely less known than the Potato, is the Tomato. Like the Potato, the Tomato came originally from South America, and was probably cultivated by the natives of that country when first visited by Europeans. For a long time the fruit of this plant was valued only for its ornamental appearance, but its use at the table has steadily increased during the last forty or fifty years,

Fig. 9. FRUITS OF THE RED PEPPER.

and now it is considered almost indispensable. It is used not only in its fresh state, but is skilfully preserved in different ways. Very many varieties have been originated and the fruit greatly improved. The name, Tomato, is derived from the Indian name, Tomatl, by which it was called when first noticed by the Spaniards.

The Egg Plant is a species of Solanum, cultivated for its fruit, which is considered a delicacy for the table, when properly prepared and cooked. It originated in Asia. Like the Potato and the Tomato, this plant has been greatly improved by cultivation. The fruit is yellowish-white or purple in color, and of the size of a

Fig. 11. Datura.

hen's egg to six or nine inches in length, and of an ovoid form. Only the purple varieties are now thought worth cultivating for the table.

Still another culinary vegetable that this natural family supplies is the Red Pepper, *Capsicum*, used as a condiment. It was originally from South America. There are quite a number of varieties, of different sizes and forms, all having the same properties.

In the year 1560, JEAN NICOT, French ambassador to Portugal, sent from Lisbon to France what had been in use there for forty years as a valuable medicinal plant. From this circumstance the plant received in France the name, Nicotiana; but it had previously acquired the name of Tabago, or Tobacco. In San Domingo the name of the pipe in which the natives smoke the Tobacco leaves is Tabago, or Tabaco, and the Europeans carried away this name with the plant. The botanical name is now *Nicotiana tabacum*.

The cultivation of Tobacco had been carried on to some extent in both North and South America before the country was discovered by Europeans, and the leaves were highly prized by the natives for smoking. Strangely enough, no wild species has been found that can be identified as that now known as *N. tabacum*. A species known as *N. rustica* was cultivated by the Mexicans and by the northern Indians; it is found wild, growing as far north as the State of New York; this species is hardier than the common Tobacco, and is cultivated in eastern Europe and Turkey. Soon after the introduction of Tobacco into France, its cultivation was commenced there, and has been continued ever since. It is said that NICOT, to whom we have referred before, sent a box of the dried and powdered leaves as a present to the handsome, talented, and wicked queen, CATHARINE DE MEDICI, who then acquired a taste for it, and for some time thereafter the plant was known as *Herbe a la Reine.*

Captain DRAKE introduced the plant into England. The use of Tobacco has extended to every country in the world, unless it be to some of the tribes of the interior of Africa, and its use there cannot be long delayed, since every section of that continent is being traversed by the whites, and Tobacco, like distilled liquors, appears to be a concomitant of civilization.

A great variety of opinions have been held by physicians about the injurious effects of the habitual use of this plant. Persons of sound health, commencing its use after the physical system is mature, can, no doubt, use it moderately without any apparent bad results. But upon children and youths, and those in delicate health, its effects are very pernicious. If used freely by young persons it prevents the full development of the body, and frequently produces disease, such as inflamation of pharynx, dyspepsia, palpitation of the heart, nervousness, and blindness. In Spain, and in most of the countries of South America, the women, as well as most of the men, smoke. Smoking is the mode of its use most general. Chewing is more practiced in this country than any other. In the Southern States some of the young

Fig. 10. Petunia.

women practice what is called dipping, which consists in the use of snuff by taking it up on a small brush or the end of a moistened stick and rubbing it on the teeth and gums; when older, they forsake this practice for the use of the pipe.

The peculiar effects of Tobacco are due to an extremely poisonous alkaloid, called nicotine.

The oil of Tobacco is a most violent and deadly poison.

The order Solanaceæ contributes quite a number of plants that are cultivated for ornament; besides many species and varieties of Solanums that are so employed, we may mention a few with which we are all familiar, such as the Nierembergia, a pretty, trailing plant; the Datura, some varieties of which within a few years have become popular; and the Petunia, now almost universally raised wherever attention is paid to flowers. It is difficult to account for the name, Petunia, being attached to this plant. The natives of the most northern portion of South America, bordering on the Caribbean sea, used the name, tabaco, for the leaf of the Tobacco when used for smoking, but when it was snuffed they called it petum; from this word is derived the name, Petunia.

In this sketch of the Nightshade family we have shown the affinities of some plants with which we are quite familiar, but only a faint idea is given of the magnitude of this order. Of the Solanums alone there are about 900 well defined species, and this is only one, although the largest, of the sixty genera that form this remarkable group of plants.

Most of the Solanaceous plants have rank and disagreeably scented foliage, and contain an emetic and narcotic alkaloid called Solanine; this substance is present even in the buds that spring from the eyes of the Potato, and in the skin of the Potato. The Potato, as before remarked, is almost entirely starch, and, as such, is quite innocuous. A decoction of Tomato leaves is recommended for destroying insects. The medicinal substances, Belladona, Stramonium, Henbane, Black Nightshade, &c., are derived from plants of this order, and are all poisonous to a greater or less extent.

CLAYTONIA VIRGINICA.

This delicate little plant, flowering about the last of April here, but rarely found in New England, flowers in loose racemes of pink, veined with red. It is cup-shaped, and remains in bloom but a few days. The root is tuberous, buried at a depth in the ground equal to the height of the plant. The root-leaves are few, if any, but the flower-stalks have, generally, a pair of opposite leaves half way up. It is found in great perfection in this section, and botanists find it about the first of all that opens. It was named after Dr. JOHN CLAYTON, an eminent botanist of Virginia, now dead.

"Our Father might have made enough
For every want of ours—
For luxury, medicine, and toil,
And yet have made no flowers."

—A. B. S., *Canandaigua, N. Y.*

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